I. Waldburg

# THE SOUTHERN AGRICULTURIST, HORTICULTURIST,

AND

# REGISTER OF RURAL AFFAIRS.

ADAPTED TO THE

Southern Section of the United States.

NEW SERIES.

VOL. 2—NO. IX.

SEPTEMBER, 1842.

EDITED BY J. D. LEGARE.

MONTHLY.

CHARLESTON, S. C.

PUBLISHED BY A. E. MILLER,

95 BROAD-STREET.

*Five Dollars a Year,*

IN ADVANCE.

☞ *Four Sheets Periodical.—Postage—100 miles, 6¼ cts.; over 100 miles, 12½ cts.*

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## HORTICULTURE.



## MISCELLANEOUS.

# THE SOUTHERN AGRICULTURIST.

(NEW SERIES.)

**Vol. II. FOR SEPTEMBER, 1842. No. 9.**

## ON MANURES.

*Extracted from Prof. Liebig's "Organic Chemistry."*

When it is considered that every constituent of the body of man and animals is derived from plants, and that not a single element is generated by the vital principle, it is evident that all the inorganic constituents of the animal organism must be regarded, in some respect or other, as manure. During their life, the inorganic components of plants which are not required by the animal system, are disengaged from the organism, in the form of excrements. After their death, their nitrogen and carbon pass into the atmosphere as ammonia and carbonic acid, the products of their putrefaction, and at last nothing remains except the phosphate of lime and other salts in their bones. Now this earthy residue of the putrefaction of animals must be considered, in a rational system of agriculture, as a powerful manure for plants, because that which has been abstracted from a soil for a series of years must be restored to it, if the land is to be kept in a permanent condition of fertility.

We may now inquire whether the excrements of animals, which are employed as manure, are all of a like nature and power, and whether they, in every case, administer to the necessities of a plant by an identical mode of action. These points may easily be determined by ascertaining the composition of the animal excrements, because we shall thus learn what substances a soil really receives by their means. According to the common view, the action of solid animal excrements depends on the decaying organic matters which replace the humus, and on the presence of certain compounds of nitrogen, which are supposed to be assimilated by plants, and employed in the production of gluten and other azotized substances. But this view requires further confirmation with respect to the solid excrements of animals, for they contain so small a proportion of nitrogen, that they cannot possibly by means of it exercise any influence upon vegetation.

We may form a tolerably correct idea of the chemical nature of animal excrement without further examination, by comparing the excrements of a dog with its food. When a dog is fed with flesh and bones, both of which consist, in great part, of organic substances containing nitrogen, a moist white excrement is produced which crumbles gradually to a dry powder in the air. This excrement consists of the phosphate of lime of the bones, and contains scarcely $\frac{1}{100}$ part of its weight of foreign organic substances. The whole process of nutrition in an animal consists in the

progressive extraction of all the nitrogen from the food, so that the quantity of this element found in the excrements must always be less than that contained in the nutriment. The analysis of the excrements of a horse by Macaire and Marcet proves this fact completely. The portion of excrements subjected to analysis was collected whilst fresh, and dried *in vacuo* over sulphuric acid; 100 parts of it (corresponding to from 350 to 400 parts of the dung before being dried) contained 0.8 of nitrogen. Now every one who has had experience in this kind of analysis is aware that a quantity under one per cent. cannot be determined with accuracy. We should, therefore, be estimating its proportion at a maximum, were we to consider it as equal to one half per cent. It is certain, however, that these excrements are not entirely free from nitrogen, for they emit ammonia when digested with caustic potash.

The excrements of a cow, on combustion with oxide of copper, yielded a gas which contained one vol. of nitrogen gas, and 26.30 vol. of carbonic acid.

100 parts of fresh excrements contained

| | |
|---|---|
| Nitrogen, | 0.506 |
| Carbon, | 6.204 |
| Hydrogen, | 0.824 |
| Oxygen, | 4.818 |
| Ashes, | 1.748 |
| Water, | 85.900 |
| | 100 000 |

Now, according to the analysis of *Boussingault*, which merits the greatest confidence, hay contains one per cent. of nitrogen; consequently, in the 25 lbs. of hay which a cow consumes* daily, ¼ of a lb. of nitrogen must have been assimilated. This quantity of nitrogen entering into the composition of muscular fibre would yield 8·3 lbs. of flesh in its natural condition.* The daily increase

* 100 lbs. of flesh contain on an average 15.86 of muscular fibre: 18 parts of nitrogen are contained in 100 parts of the latter.—*L.*

The flesh of animals when digested in repeated portions of cold water, affords albumen, saline substances, and coloring and extractive matters. When the part that is no longer acted on by cold water is digested in hot water, the cellular substance is removed in the form of *gelatine*, and fatty matter separates. The insoluble residue is principally *fibrine*.

The following is the proportion of water, albumen, and gelatine in the muscular parts of several animals and fishes.

| 100 *parts of Muscle of* | *Water.* | *Albumen or Fibrine.* | *Gelatine.* | *Total of Nutritive Matter.* |
|---|---|---|---|---|
| Beef, | 74 | 20 | 6 | 26 |
| Veal, | 75 | 19 | 6 | 25 |
| Mutton, | 71 | 22 | 7 | 29 |
| Pork, | 76 | 19 | 5 | 24 |
| Chicken, | 73 | 20 | 7 | 27 |
| Cod, | 79 | 14 | 7 | 21 |
| Haddock, | 82 | 13 | 5 | 18 |

See Brande's *Chemistry*, 4th edit. p. 1184.

in size of a cow is, however, much less than this quantity. We find that the nitrogen, apparently deficient, is actually contained in the milk and urine of the animal. The urine of a milch-cow contains less nitrogen than that of one which does not yield milk; and as long as a cow yields a plentiful supply of milk, it cannot be fattened. We must search for the nitrogen of the food assimilated not in the solid, but in the liquid excrements. The influence which the former exercise on the growth of vegetables does not depend upon the quantity of nitrogen which they contain. For if this were the case, hay should possess the same influence; that is, from 20 to 25 lbs. ought to have the same power as 100 lbs. of fresh cow dung. But this is quite opposed to all experience.

Which then are the substances in the excrements of the cow and horse which exert an influence on vegetation?

When horse's-dung is treated with water, a portion of it to the amount of 3 or 3½ per cent. is dissolved, and the water is colored yellow. The solution is found to contain phosphate of magnesia, and salts of soda, besides small quantities of organic matters. The portion of the dung undissolved by the water yields to alcohol a resinous substance possessing all the characters of gall which has undergone some change; while the residue possesses the properties of saw dust, from which all soluble matter has been extracted by water, and burns without any smell. 100 parts of the fresh dung of a horse being dried at 100° C. (212° F.) leave from 25 to 30 or 31 parts of solid substances, and contained, accordingly, from 69 to 75 parts of water. From the dried excrements, we obtain, by incineration, variable quantities of salts and earthy matters, according to the nature of the food which has been taken by the animal. *Macaire* and *Marcet* found 27 per cent. in the dung analyzed by them; I obtained only 10 per cent. from that of a horse fed with chopped straw, oats, and hay. It results then that with from 3,600 to 4,000 lbs. of fresh horse's dung, corresponding to 1,000 lbs. of dry dung, we place on the land from 2,484 to 3,000 lbs. of water, and from 730 to 900 lbs. of vegetable and altered gall, and also from 1000 to 270 lbs. of salts and other inorganic substances.*

The latter are evidently the substances to which our attention should be directed, for they are the same which formed the component parts of the hay, straw, and oats, with which the horse was fed. Their principal constituents are the phosphates of lime and

* Analysis of horse-dung by Dr. C T. Jackson.—500 grains dried at a heat a little above that of boiling water, lost 357 grains, which was water.

The dry mass, weighing 143 grains, was burned, and left 8·5 grains of ashes, of which 4.80 grains were soluble in dilute nitric acid, and 3.20 insoluble. The ashes being analyzed, gave,—

| | |
|---|---|
| Silex, | 3.2 |
| Phosphate of lime, | 0.4 |
| Carbonate of " | 1.5 |
| Phos. magnesia and soda, | 2.9 |
| | 8.0 |

magnesia, carbonate of lime and silicate of potash; the first three of these preponderated in the corn, the latter in the hay.

Thus in 1,000 lbs. of horse's-dung, we present to a field the inorganic substances contained in 6,000 lbs. of hay, or 8,300 lbs. of oats (oats containing 3.1 per cent. ashes according to *De Saussure*). This is sufficient to supply 1½ crop of wheat with potash and phosphates.

The excrements of cows, black cattle and sheep, contain phosphate of lime, common salt, and silicate of lime, the weight of which varies from 9 to 28 per cent., according to the fodder which the animal receives; the fresh excrements of the cow contain from 86 to 90 per cent. of water.

Human fæces have been subjected to an exact analysis by *Berzelius*. When fresh they contain, besides ¾ of their weight of water, nitrogen in very variable quantity, namely, in the minimum 1½, in the maximum 5 per cent. In all cases, however, they were richer in this element than were the excrements of other animals. *Berzelius* obtained, by the incineration of 100 parts of dried excrements, 15 parts of ashes, which were principally composed of the phosphates of lime and magnesia.

It is quite certain that the vegetable constituents of the excrements with which we manure our fields cannot be entirely without influence upon the growth of the crops on them, for they will decay, and thus furnish carbonic acid to the young plants. But it cannot be imagined that their influence is very great, when it is considered that a good soil is manured only once every six or seven years, or once every eleven or twelve years, when esparsette or lucern have been raised on it, that the quantity of carbon thus given to the land corresponds to only 5·8 per cent. of what is removed in the form of herbs, straw, and grain, and further that the rain-water received by a soil contains much more carbon in the form of carbonic acid than these vegetable constituents of the manure.

The peculiar action, then, of the solid excrements is limited to their inorganic constituents, which thus restore to a soil that which is removed in the form of corn, roots, or grain. When we manure land with the dung of the cow or sheep, we supply it with silicate of potash and some salts of phosphoric acid. In human fæces we give it the phosphates of lime and magnesia; and in those of the

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It consists, then, of the following ingredients:

| | |
|---|---|
| Water, | 357.0 |
| Vegetable fibre and animal matter, | 135.0 |
| Silica, | 3.2 |
| Phosphate of lime, | 0.4 |
| Carbonate of " | 1.5 |
| Phos. magnesia and soda, | 2.9 |
| | 500.0 |

—*Geological and Agricultural Survey of Rhode Island*, p. 205.

horse, phosphate of magnesia, and silicate of potash. In the straw which has served as litter, we add a further quantity of silicate of potash and phosphates; which, if the straw be putrefied, are in exactly the same condition in which they were before being assimilated.

It is evident, therefore, that the soil of a field will alter but little, if we collect and distribute the dung carefully; a certain portion of the phosphates, however, must be lost every year, being removed from the land with the corn and cattle, and this portion will accumulate in the neighbourhood of large towns. The loss thus suffered must be compensated for in a well managed farm, and this is partly done by allowing the fields to lie in grass. In Germany, it is considered that for every 100 acres of corn land, there must, in order to effect a profitable cultivation, be 20 acres of pasture-land, which produce annually, on an average, 590 lbs. of hay. Now, assuming that the ashes of the excrements of the animals fed with this hay amount to 6.82 per cent., then 341 lbs. of the silicate of lime and phosphates of magnesia and lime must be yielded by these excrements, and will in a certain measure compensate for the loss which the corn-land had sustained. The absolute loss in the salts of phosphoric acid, which are not again replaced, is spread over so great an extent of surface, that it scarcely deserves to be taken account of. But the loss of phosphates is again replaced in the pastures by the ashes of the wood used in our houses for fuel.

We could keep our fields in a constant state of fertility by replacing every year as much as we remove from them in the form of produce; but an increase of fertility, and consequent increase of crop, can only be obtained when we add more to them than we take away. It will be found, that of two fields placed under conditions otherwise similar, the one will be most fruitful upon which the plants are enabled to appropriate more easily and in greater abundance those contents of the soil which are essential to their growth and development.

From the foregoing remarks it will readily be inferred, that for animal excrements, other substances containing their essential constituents may be substituted. In Flanders, the yearly loss of the necessary matters in the soil is completely restored by covering the fields with ashes of wood or bones, which may or may not have been lixivated* and of which the greatest part consists of phosphates of lime and magnesia. The great importance of manuring with ashes has been long recognized by agriculturists as the result of experience. So great a value, indeed, is attached to this material in the vicinity of Marburg and in the Wetterau,† that it is

* *Lixiviation* signifies the removal by water of the soluble alkaline or saline matters in any earthy mixture; as from that of lime and potash, or from ashes to obtain a ley.

† Two well known agricultural districts; the first in Hesse-Cassel, the second in Hesse-Darmstadt.—TRANS.

transported as a manure from the distance of 18 or 24 miles.* Its use will be at once perceived, when it is considered that the ashes, after having been washed with water, contain silicate of potash exactly in the same proportions as in straw ($10\ Si\ O_3 \times K\ O$), and that their only other constituents are salts of phosphoric acid.

But ashes obtained from various kinds of trees are of very unequal value for this purpose; those from oakwood are the least, and those from beech the most serviceable. The ashes of oak-wood contain only traces of phosphates, those of beech the fifth part of their weight, and those of the pine and fir from 9 to 15 per cent. The ashes of pines from Norway contain an exceedingly small quantity of phosphates, namely, only 1·8 per cent. of phosphoric acid. *(Berthier.)*†

With every 100 lbs. of the lixiviated ashes of the beech which we spread over a soil, we furnish as much phosphates as 460 lbs. of fresh human excrements could yield. Again, according to the analysis of *De Saussure*, 100 parts of the ashes of the grain of wheat contain 32 parts of soluble, and 44.5 of insoluble phosphates, in all 76.5 parts. Now the ashes of wheat straw contain 11.5 per cent. of the same salts; hence with every 100 lbs. of the ashes of the beech, we supply a field with phosphoric acid sufficient for the production of 3820 lbs. of straw (its ashes being calculated at 4.3 per cent. *De Saussure)*, or for 15.18000 lbs. of corn, the ashes of which amount, according to *De Saussure*, to 1.3 per cent.

Bone manure possesses a still greater importance in this respect. The primary sources from which the bones of animals are derived are the hay, straw, or other substances which they take as food. Now if we admit that bones contain 55 per cent. of the phosphates of lime and magnesia (Berzelius), and that hay contains as much of them as wheat-straw, it will follow that 8 lbs. of bones contain as much phosphate of lime as 1000 lbs. of hay or wheat-straw, and 2 lbs. of it as much as 1000 lbs. of the grain of wheat or oats. These numbers express pretty exactly the quality of phosphates

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* Ashes are used with great advantage on the light siliceous soil of Long Island, Connecticut, and various other places in the United States.

† The existence of phosphate of lime in the forest soils of the United States, is proved not only by its existence in the *pollen* of the *pinus abies* (which is composed of 3 per cent. phosphate of lime and potash), but by its actual detection in the ashes of pines and other trees.—100 parts of the ashes of *wood* of *pinus abies* give 3 per cent phosphate of iron; 100 parts of the ashes of the *coal* of *pinus sylvestris* give 1.72 phosphate of lime, 0.25 phosphate of iron; 100 parts of ashes of oak coal give 7.1 phosphate of lime, 3.7 phosphate of iron; 100 parts of the ashes of bass wood give 5.4 phosphate of lime, 3.2 phosphate of iron; 100 parts of the ashes of birch wood give 7.3 phosphate of lime, 1.25 phosphate of iron; 100 parts of the ashes of oak wood give 1.8 phosphate of lime; 100 parts of the ashes of alder coal give 3.45 phosphate of lime, 9 phosphate of iron. These are the calculated results from Berthier's analyses."—Dr. S. L. Dana, in *Report on a Reexamination of the Economical Geology of Massachusetts.*

which a soil yields annually on the growth of hay and corn. Now the manure of an acre of land with 40 lbs. of bone dust is sufficient to supply three crops of wheat, clover, potatoes, turnips, &c., with phosphates. But the form in which they are restored to a soil does not appear to be a matter of indifference. For the more finely the bones are reduced to powder, and the more intimately they are mixed with the soil, the more easily are they assimilated. The most easy and practical mode of effecting their division is to pour over the bones, in a state of fine powder, half of their weight of sulphuric acid diluted with three or four parts of water, and after they have been digested for some time, to add one hundred parts of water, and sprinkle this mixture over the field before the plough. In a few seconds, the free acids unite with the bases contained in the earth, and a neutral salt is formed in a very fine state of division. Experiments instituted on a soil formed from grauwackè, for the purpose of ascertaining the action of manure thus prepared, have distinctly shown that neither corn, nor kitchen-garden plants, suffer injurious effects in consequence, but that on the contrary they thrive with much more vigor.

In the manufactories of glue, many hundred tons of a solution of phosphates in muriatic acid are yearly thrown away as being useless. It would be important to examine whether this solution might not be substituted for the bones. The free acid would combine with the alkalies in the soil, especially with the lime, and a soluble salt would thus be produced, which is known to possess a favorable action upon the growth of plants. This salt, muriate of lime (or chloride of calcium,) is one of those compounds which attracts water from the atmosphere with great avidity, and might supply the place of gypsum in decomposing carbonate of ammonia, with the formation of sal-ammoniac and carbonate of lime. A solution of bones in muriatic acid, placed on land in autumn or in winter would, therefore, not only restore a necessary constituent of the soil, and attract moisture to it, but would also give it the power to retain all the ammonia which fell upon it dissolved in the rain during the period of six months.

The ashes of brown coal* and peat often contain silicate of potash, so that it is evident that these might completely replace one of the principal constituents of the dung of the cow and horse, and they contain also some phosphates† Indeed, they are much esteemed in the Wetterau as manure for meadows and moist land.

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* Brown Coal. *Braunkohle, Lignite* has the structure and appearance of carbonized wood. It occurs abundantly in Germany; in Hessia it forms beds 20 to 40 feet thick, and several square miles in extent. Fibrous and compact varieties occur near Bovey Tracey in England, where it is called *Bovey coal.* Small quantities are found at Gay Head, Massachusetts.

† The following is the result of an analysis by Dr. C. T. Jackson, of peat from Lexington, Massachusetts. 100 grains, dried at 300° F. weighed 74 grains, loss

It is of much importance to the agriculturist, that he should not deceive himself respecting the causes which give the peculiar action to the substances just mentioned. It is known, that they possess a very favorable influence on vegetation; and it is likewise certain, that the cause of this is their containing a body, which, independently of the influence which it exerts by virtue of its form, porosity, and capability of attracting and retaining moisture, also assists in maintaining the vital processes in plants. If it be treated as an unfathomable mystery, the nature of this aid will never be known.

In medicine, for many centuries, the mode of actions of all remedies was supposed to be concealed by the mystic veil of Isis, but now these secrets have been explained in a very simple manner. An unpoetical hand has pointed out the cause of the wonderful and apparently inexplicable healing virtues of the springs in Savoy, by which the inhabitants cured their goître; it was shown, that they contain small quantities of iodine. In burnt sponges, used for the same purpose, the same element was also detected. The extraordinary efficacy of Peruvian bark was found to depend on a small quantity of a crystalline body existing in it, viz. quinine; and the causes of the various effects of opium were detected in as many different ingredients of that drug.

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26 grains, water. Burned in a platina crucible it left 5.0 ashes. The ashes yielded

| | |
|---|---|
| Silex, | 1.0 |
| Alumina, iron, and manganese, | 0.6 |
| Phosphate of lime, | 3.0 |
| Potash, traces. | |
| | 4.6 |

Peat from Watertown, Massachusetts, yielded 4.5 grains of ashes, which gave by analysis

| | |
|---|---|
| Silex, | 1.3 |
| Alumina, oxide of iron, and manganese, | 1.5 |
| Phosphate of lime, | 1.7 |
| | 4 5 |

The vegetable matter amounted to 95.5 per cent., consisting of vegetable fibre, and apocrenic and crenic acids, in part combined with the bases obtained from its ashes. See *Report on Rhode Island*, p. 233.

*Swamp muck* contains the same ingredients as peat, but the vegetable matters are more finely divided more soluble, and there is generally a larger proportion of earthy matters. It is formed of the fine particles of humus, washed out from the upland soils, and of the dead and decomposed leaves and roots of swamp plants.

The pulpy matter of both peat and swamp muck consists chiefly of the apocrenic acid, in part combined with the earthy bases, and metallic oxides. The crenic acid is frequently united with lime, manganese; iron and magnesia occur in several of the peats analyzed. Phosphoric acid also exists in them, both in its free state, and in combination with lime and magnesia. In some peats Dr. J. found traces of oxalic acid and oxalates. *Ibid.*, 210. See APPENDIX' for *Peat compost.*

Calico printers used for a long time the solid excrements of the cow, in order to brighten and fasten colors on cotton goods; this material appeared quite indispensable, and its action was ascribed to a latent principle which it had obtained from the living organism. But since its action was known to depend on the phosphates contained in it, it has been completely replaced by a mixture of salts, in which the principal constituent is phosphate of soda.

Now, all such actions depend on a definite cause, by ascertaining which, we place the actions themselves at our command.

It must be admitted as a principle of agriculture, that those substances which have been removed from a soil must be completely restored to it, and whether this restoration be effected by means of excrements, ashes, or bones, is in a great measure a matter of indifference. A time will come when fields will be manured with a solution of glass* (silicate of potash), with the ashes of burnt straw, and with salts of phosphoric acid, prepared in chemical manufactories, exactly as at present medicines are given for fever and goître.

There are some plants which require humus and do not restore it to the soil by their excrements; whilst others can do without it altogether, and add humus to a soil which contains it in small quantity. Hence, a rational system of agriculture would employ all the humus at command for the supply of the former, and not expend any of it for the latter; and would in fact make use of them for supplying the others with humus.

(To be continued.)

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## WINTER RYE FOR EARLY SPRING FEED.

The following article, which we copy from the Journal of the Royal Agricultural Society of England, is worthy of attention by many farmers of this country. The length of our winters, and the lateness of the season before our cows and your stock can get a good supply of feed from our pastures, render it very desirable to find some article which may answer for feeding or soiling earlier than any that is in general use among us. Rye is sometimes sown for feed, but when it looks well, the farmer is reluctant to turn in his cattle upon it. But its luxuriance would not be objected to by his stock, and he must get over his compunctions. Our Indian corn crop affords us an opportunity to resort to the rye more conveniently than the English farmer can. We can sow our seed

* When glass contains a very large proportion of potash, it is soluble in boiling water; and by combination with other substances, silica becomes soluble in water. According to Dr. Jackson, crenic acid enables water to take it up.

at the last time of hoeing the corn, and the work is done. The great obstacle in the way here is, the fact that our corn in most cases covers only a part of the field, and we cannot feed the rye without turning other lands out to pasture also. With us, unless we go more extensively into the cultivation of turnips or some other crop that can be sowed later than we generally do, we must give up the land to the rye for an entire year. But we think this would be good husbandry for many farmers whose pastures are short.

The article below was based upon English soil and climate—but the necessary adaptations to our circumstances, any farmer is competent to make.—*Ed. N. E. F.*

## ON EARLY SPRING FEED.

BY MATTHEW M. MILBURN.

The increased quantity of stock which the farmer is enabled to keep by the introduction and successful cultivation of green crops, requires his best attention to furnish them with a constant supply of green food, especially such portion of his stock as are not intended for fattening. The use of the artificial grasses on arable land in summer, and of turnips in the winter, has been brought as near perfection as may be; but it is quite certain that the wants of the sheep and cattle, from the time when the turnips are consumed to that when the grasses become available, are not equally well provided for. In order, as far as possible, to remedy this deficiency, recourse has been had to the cultivation of turnips which long retain their nutritious qualities, and the Swede has been truly invaluable for this purpose. But while these roots have furnished very palatable and nutritious food for one portion of the stock, they have altogether failed for the young—the principal object of the breeder's anxiety. For as well as having an abundant flow of milk from the dam, every breeder is desirous of training the young stock to help themselves as soon as there is food of a proper quality available for them; and if the young lambs in particular are kept from green food until they are turned into the gross clover leys with their dams, there is great danger that a portion of them will be lost. It is generally desirable to keep the clover leys free at least until May, and long before that time the young stock should be trained to eat a considerable portion of green food.

With the view of supplying this want, several crops have been cultivated for early feed in the spring, with greater or less success, and under greater or less disadvantage, according to circumstances, but the farmer who occupies a poor soil is, more than any other, under the necessity of grappling with the difficulties he may have to contend with; for lateness of vegetation and certain destruction of his crops of grass, are sure to be the consequence if he break into them before they attain a proper degree of maturation, and

yet he has also the greatest difficulties to surmount in cultivating any spring crop.

The farmer, on the other hand, who cultivates rich fertile land, where he has a deep alluvial soil, growing every crop luxuriantly, can easily free a pasture early in the autumn, and have it full of young grass as early as he may require it, and knows nothing of the difficulties which attend his less favored neighbor.

The avidity with which any new variety of grass or plant promising early growth is tried, indicates how desirable a point it is to secure an early supply of succulent food. At one time it was hoped that this desideratum was discovered in the crimson trefoil.

The winter tare is one of the most valuable esculents for stock in possession of the cultivator, and affords the greatest bulk of nutriment of any cultivated green crop, turnips perhaps excepted, and is relished at all seasons and by every kind of stock. It is sometimes resorted to for depasturation in the spring, with a view to subsequent soiling, but it is after all rather a *summer* than a *spring* crop; and it is more than problematical that the injury done to the crop by spring feeding upon it, is greater than the amount of spring food thus obtained. If it be worth while to have a supply of early feed, it is worth while clearly to provide a crop especially for that purpose. As a *spring* crop, according to the writer's observation and experience, it is decidedly inferior to other cultivated plants.

The writer of this paper has seen rye-grass very successfully cultivated as early spring feed sown alone. It requires to be sown a whole year before it is fit to consume, and thus lies open to the objection of interfering with good husbandry, particularly the hoeing of the corn crop, with which it is sown a whole year before, as well as preventing the plowing of the land for the same period; thus encouraging the growth of quitch and weeds, while the adhesion of the soil which it produces, and the accumulation of roots, &c. very materially prevent its kindly working for the crop intended to follow.

The above remarks are made on the supposition that the rye grass is introduced as a half crop, for it must be quite clear to every practical farmer that there is no sound practice in throwing away a whole year's crop for the sake of one month's feed in the spring, valuable as it undoubtedly is. The trials above mentioned which the writer has seen, have been with Pacey's rye grass, and though the Italian rye grass would furnish a greater portion of food, supposing it tillered as much as Pacey's, which is not the case, yet it is liable to all the above objections, and from the observation of the writer it appears exceedingly doubtful whether it will bear an equal degree of frost to Pacey's.

It is the intention of the writer now to state his experience, and offer his recommendation of a crop embracing all the advantages of the preceding, and several peculiar to itself. It is that of *rye*,

eaten in the early stages of its growth. It is intended to intervene between the last crop of the four-course system, which is generally wheat, and to be eaten, and the land ploughed and worked for a crop of turnips. It is equally applicable to all kinds of rotations, and would well precede a fallow or a crop of rape. As it is generally upon farms where the four-course system is pursued that spring feed is most wanted, the writer will confine his observations to that rotation.

So soon as the wheat is cut in the autumn, the plough should be set to work. This may be done even before it is carted, during the mornings of harvest. A single ploughing is given, and a very slight dressing of any kind of short manure. In some cases where the farmer lays on his manure in the autumn for turnips the ensuing year, it might be better to lay it on before the ploughing. It should be remembered that the slight dressing should not all be considered as given to the rye; in reality it becomes incorporated with the soil, and more intimately mixed with it than by the ordinary mode of spreading it on in the autumn, and any part of it which the rye may abstract, will be more than compensated by the droppings of the stock and the carbonic acid gas which they evolve while consuming it; and which the soil more readily absorbs in the spring than in any other part of the year, evaporation going on at that period to a much smaller extent than in any other.

The seed must be sown upon the plough-seam broad cast, at the rate of 2½ bushels per acre, and if of that year's growth, so much the better, as it is earlier and more certain of germination. To this a peck of rapeseed per acre should be added; for although the latter is not able to stand a winter when the frost sets in early and severe, in many cases it will get sufficiently vigorous to resist any ordinary frost, and will much improve the feed in the spring. Should the rape not be sown, a peck of winter-tares per acre will improve the feed, or an additional peck of rye may be added; as a fuller bite and excited growth in its early stages will be secured—a point gained when wanted to depasture, although it might be injurious if sown for a crop.

In cultivating rye as feed there need be no fears entertained of its becoming "winter proud," for as that only affects the ears of the corn, it is a circumstance of no importance, and therefore the earlier it is sown the better able it is to resist the early frosts, as well at having a better cover and more feed when wanted. When sown it should be thoroughly harrowed, but not rolled—a *double* with a pair of fine harrows is sufficient, and the surface weeds should be gathered off, or the whole raked with the hand, which will more efficiently cover the seed. An advantage is gained to the soil by this ploughing, which cannot be obtained when the land is sown with the vetches. The annual weeds on the old surface are prevented from running to seed, and a new surface is exposed to the air and frost.

The rye will be fit for consuming the last week in March or the first in April, or if allowed to remain until the middle of the latter month, it will carry a greater quantity of stock. After it is thoroughly eaten up, it should be freed, and by the first week in May, will afford another pasture of fine young nutritious feed; at least, in ordinary seasons. It is bad management, though sometimes practiced, to allow the rye to remain uneaten until the seed-stalk begins to shoot, for in that case it will become much less palatable and useful. By consuming it young, it is much more valuable, and the succession crop equally so as the first.

The second crop being consumed, the plough must be put into operation, and the soil prepared for the succeeding crop; and the advantage of its cultivation, by no means a small one, is, that it interferes with no other crop.

Perhaps a short digression may be pardoned on the subsequent preparation of the soil. The writer's practice is different to that of most other persons. Usually it is cross-ploughed a fortnight after its first ploughing. Time is thus lost, and the slices are cut into squares difficult to be acted upon by the harrow. The writer begins to harrow as soon as the newly turned up surface of the first ploughing is sufficiently dry. This brings up the lowest part of the roots of the weeds and closes the interstices of the furrows, so that the remains of vegetation being covered, deprived of air, and gathering moisture, begin to decompose. Instead of cross-ploughing, it is again ploughed lengthways, and the old surface again brought up and harrowed. The weeds separate much more easily by this process, and much time and labor is saved; the same practice is applied to bastard fallows with the same good effects.

Rye has the decided advantage of being capable of resisting *any conceivable* degree of frost, and when even the hardy wheat is carried off by an ungenial season, it will escape injury, and even thrive. At this time (Feb. 21, 1840,) the writer has a plot growing for feed which would now afford more eating than almost any mixture of artificial grasses in the middle of April, and that on a thin light soil not worth more to rent than 25*s.* per acre. Some of the rape has succeeded, even in this season of incessant rain, which prevailed not only in the early stages of its growth, but ever since it was sown. It can bear so much and constant wet, worse even than frost.

The expense of this crop will be somewhere as under. Say per acre—

| | |
|---|---|
| 2 1-2 bushels of rye at 4*s.* 6*d.* | 11*s.* 3*d.* |
| 1-2 peck of rape, | 0 10 1-2 |
| | 12 1 1-2 |

It should be remembered that this interferes with no operation of husbandry, and prevents no crop, so that no rent of land or other extras are to be reckoned—the ploughings would be nearly the

same if the rye were not sown. Nothing is better relished by stock at the season when it is intended to be used; a guide by no means unsafe as to its nutritious qualities, and which is borne out by the condition of the stock feeding on it.

To recapitulate the advantages of its cultivation:

1. Provisions of excellent green food is made at a season of the year when of all others it is most wanted.

2. It is produced without sacrificing any portion of the usual rotations pursued on a farm, and with little extra labor, nor does it interfere with the management of any preceding or succeeding crops.

3. It will grow on any soil, but is especially calculated for poor loose sand, when every other green esculent is more or less uncertain.

4. It will bear any degree of frost to which our climate is subject, and is sufficiently hardy to defy the effects of the coldest situations in the country, being there cultivated instead of wheat for a corn crop from necessity.

5. It is as inexpensive or more so than any grass or leguminous plant.

6. It is readily consumed by stock, especially young animals.

7. It improves rather than deteriorates the soil upon which it is grown.

*Thorpfield, near Thirsk, Yorkshire, England.*

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## PLASTER OF PARIS.

[The following answers on the use of plaster, is worthy of the attention of our planters. In this State it is almost wholly neglected, but now that the rationale of its action is explained by late discoverers, it will undoubtedly be used extensively.—ED. So. AGR.]

### ANSWERS TO QUERIES OF A CORRESPONDENT OF THE AMERICAN FARMER.

Plaster may not only "be applied with advantage to *old fields*," but to all other fields. We have repeatedly advised its use on *old fields*, pastures and stubble fields, with the two fold purpose of improving the pasture and the soil. The natural tendency of plaster, is, to encourage the growth of white clover in any soil whereon it may be sown, and is therefore doubly useful—first by increasing the food, and secondly by providing a vegetable ley to be ploughed in. If it did no more than that, its utility would be unquestionable, but its virtues do not stop here; it attracts food from the atmosphere, assimilates with it, and fixes it in the earth, whence it is fed out to the growing plants—and thus adds to the farmer's stock of manure from sources which are hid from the human eye.

*Plaster* should be sown over the manure when spread for being ploughed in—it would then prevent the escape of rich gases, which are otherwise lost.

*Plaster* should be spread over the manure heap while it is being accumulated, and for the object just stated.

*Plaster* should be mixed up with all compost heaps.

*Plaster* should be strewn over the stable, barnyard and cow sheds, to fix the ammonia or the urine and prevent its escape.

*Plaster* should be sown over every field, when first ploughed up, at the rate of a bushel to the acre—over clover fields in the spring when vegetation begins to start, and if tobocco and corn fields, instead of receiving it in the hill, were to receive it broadcast—the interest of the corn and tobacco planter would be greatly promoted.

In a word—Plaster may advantageously be used every where, except, *perhaps*, on timothy meadows, there it *might* be found too encouraging to the growth of white clover; but *there*, when the grass was run out and the ground being about to be broken up, it should be sown *immediately* after the last cutting, as the growth of white clover, which it would promote, would be more than equal to a slight dressing of manure. [*Amer. Farmer.*

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For the Southern Agriculturist.

## REMARKS ON THE IMPROPER USE OF THE PLOUGH IN THE CULTIVATION OF INDIAN CORN.

MR. EDITOR:

*Dear Sir*,—By request, I submit to you, for insertion in the *Agriculturist*, some remarks and experiments, I have made, to prove that the plough is frequently used too late, and much to the injury of our Corn crops.

It is well known to rice planters, that when rice is in joint and forming its ear, every effort must be made to advance its growth, so that good ears may be formed. The same effort, to effect the same result, is necessary with Corn, and all other grains. When the ear is about to be formed, the atmosphere has less influence on the plant than previously; therefore, more is required from the roots. If the soil is fertile, and well broken up with the plough previous to planting corn, innumerable small fibrous roots will run laterally, in search of nutriment, to the distance of six or eight feet, and sometimes as far as twenty feet. These laterals are very small, and easily separated from the stalk; if cut by the plough when the plant is young, no injury will be sustained, and perhaps a benefit: but they must not be cut or disturbed in any way, when far advanced toward maturity. Without their aid at that period,

the perpendicular, or tap-root, will not be sufficient to produce good and well filled ears. It is not unfrequently the case, that the plough is used when the Corn is in silk, and at that time these lateral roots are very numerous above the surface of the ground, and must necessarily be cut, much to the injury of the crop. I have made several experiments which prove conclusively, that the perpendicular or tap-roots, are not sufficient without the aid of the lateral roots, to produce good and well filled ears; and that, if the plough is used too late, a good crop cannot be expected. For my experiment, I selected eight well grown stalks, just before shooting out their tassels. I had the earth cut round two of these stalks about six or eight inches from them, to the depth and width of the spade, and the earth removed, so that I could see that all of the side roots were cut. The earth was permitted to remain in this situation until the Corn was matured. The stalks looked well, and the ears appeared to be well filled; but, on examination, it was found, that there were but a few scattered grains in them.

In the next experiment, a cut was made round two stalks, with a spade to its depth and width, at the same distance as above. This cut was permitted to close immediately, no earth having been removed. The result was, small ears, not well filled.

The third experiment was to cut the roots on two sides of the stalks, as they are usually cut in late ploughing. On the other sides the roots were not disturbed. The result—small ears, tolerably well filled.

In the remaining two stalks, no roots were cut or disturbed; the ears large and well filled.

The plough is not sufficiently used on our rice plantations, in preparing Corn land for planting, and is generally used too late after planting. If the soil has been well prepared, and in good tilth, the cultivator, or hoe-harrow, may be used most advantageously after the second ploughing. As soon as the plants can be ploughed, the first furrow ought to be thrown from it, and the second to it; and if used again, the sooner the better, so that the Corn may be laid by, when it has attained a third of its growth, or very soon after.

I will here remark, that the planter who wishes to increase his Corn crop in quantity, must select his seed in the field. Seed from those stalks that have produced from three to six ears, will, in like manner, produce again from three to six ears, if the soil is well manured and well cultivated; and seed from those stalks that have produced one ear, will again, in all probability, produce but one ear.

Respectfully, your obt. servt.,

JOHN H. TUCKER.

*Hampstead, Sept. 9th*, 1842.

## LENGTH OF THE ROOTS OF CORN.

[The following extract from the *Upper Marlborough Gazette*, (for which we are indebted to the *Amer. Farmer*,) confirms, in a striking manner, the views of Mr. Tucker, on the culture of this valuable Agricultural product. We recommend the whole matter to the serious consideration of our planters: many will discover from these statements, the causes of light return from their crops, when, from every appearance, a large yield was expected.—Ed. So. Agr.]

* * * "I will give you another leaf, plucked from the great volumn of nature, which I should not have seen if I had not kept my eyes open, for I was riding at a sweeping canter through Mr. Wm. F. Berry's farm when I saw something that prompted me to rein up my horse as suddenly as you have seen an old huntsman to avoid riding across the trail ahead of the track.

A current of tremendous freshet had crossed the road and washed up some stalks of Corn; leaving the roots more perfectly bare and clean than could be done by the most careful manipulation. There they were, stretched along the course of the ravine, on the surface, the force of the current, after the dirt had all been nicely washed away, had collected the threads and spread them together like a tangled hank of white-brown thread. It struck me in an instant that I had never seen, and might never again see, so good a *specimen* to exemplify the extent and process of the *growth of the roots* of this king of grain bearing plants. So I leaped from my horse, plucked a few of the roots close from the foot of the stalk, wound them into a large ball, put it nto my pocket, and I wish you could see it, as it hangs now befor me, suspended from a nail at the top, and falling below the bottom, of a "twelve-light" window over my table—looking much like, what a gentleman guessed it was, a large "*bunch of sea-grass*" measuring *full four feet in length.*

I shall send it to be preserved in the Botanico-Agricultural Department of the *National Institute;* an establishment by-the bye, which all American Husbandmen should cherish, as it is so admirably fitted, by its collection and researches, to gather uncommon and valuable seeds and plants and advance in every way the science and profits of agriculture. The bunch of roots, spreading as already stated, from a single stalk, in all directions around to the extent of more than four feet, before it was washed up, and permeating as it were every inch of ground, suggests interesting hints and reflections on the growth and culture of that noble plant. Pray will you invite some more practical, and otherwise better qualified correspondent, to take up these *threads* and follow them to useful conclusions, as to the proper times and depths of hoeing and ploughing and manuring in reference to the propensity of this greedy plant, as here established, to open a hungry mouth, in every

minute subdivision of the soil, where a partical of nutriment can be found?

The corn in this case was probably planted about the 20th of April;—it was very good, without being very extraordinary. These facts, among others, are established by this specimen:—that up to the 5th of July—say in three months—the growth of the roots in length must exceed the stalk—that is, the solid portion of it;—that for each main root thousands of fibres branch off in search of food, and that it would not now, though the crop has been "laid by," be practicable to plough, even one furrow through the middle of the row to the depth of eight or ten inches, without severing some of the main roots, with their innumerable fibres, searching subsistence in all directions and forming a closely matted web-work. Here, as to the effect of occasional and of partial severance of the roots! can it be, under any circumstances, beneficial? and do its effect depend chiefly or entirely on the weather—or does not the fact that these roots are lying near to, or below the surface, in reference to the presence of their appropriate food, and in proportion to the depth of the tilth, admonish us that the earth, or pasture in which the plant is to graze, should be made soft and penetrable, in proportion to the quantity of sustenance to be found, and that the food being thus made accessible at planting time or before, to the messengers which are to be sent after it, these messengers, or roots, should be left quietly to do their office, without being disturbed or in any manner crossed or interrupted, after planting time: stirring only the surface lightly after that to let in air and moisture and such aliment as they may of themselves afford; and by their agency, render more soluble the food which the pasture contains, thus converting it more easily and completely to the sustenance of the plant? Let every one, Mr. Editor, draw his own conclusions, but let him not selfishly *hide his light under a bushel!* that's neither liberal nor fair." [*Amer. Farmer.*

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## HOG-FEEDING.

THE subjoined article on this subject was written in 1839, by a friend and former correspondent, since deceased. It was published in the *Mississippi Farmer* at that time; but we think it is well worthy of a more extensive circulation than we could at that time give it; and accordingly we now insert it for the benefit of our numerous readers who never saw our former paper—*Ed. S. W. Farmer.*

Cayuga, Mississippi, Dec. 3, 1839.

*Messrs. Editors,*—Over the signature of "An Inquirer," in your first number, I saw some remarks on the subject of hog-feeding, &c. As I am only an inquirer myself on the subject of raising,

with the least cost, so valuable an animal as the hog, I have thought proper to throw together a few ideas in my rough way, which probably may elicit from others their views, and by a full interchange of "*notions*" with regard to the best mode of raising them, those who are disposed to cull the good from the bad, on the subject, may avail themselves of it, and perhaps be to some extent benefited thereby.

The neglect of raising and preserving our own meats has long been a serious drain to our purses, and although all of us are not so situated as to make it our interest to raise our own meat, still the greater part might do it with comparatively but little trouble or expense. There are two or three almost distinct modes of raising swine. One way is to keep up just so many sows as will produce the number of pigs required, and feed them well: in this way they will produce more pigs than any other, and if it be convenient for the owner to turn the shoats, on weaning them, on a good crab grass field or lot, and barely attend to them sufficiently to keep them growing, he may on a very small plat of ground, raise a plenty of pork to fully answer his purposes—my views are when sows are treated in the above manner, their best food while suckling is swill—to make it, procure two barrels, put in each from a peck to a bushel of meal, to which add half the quantity of corn, rye or oats, the quantity made to be governed by the number of sows to be fed; fill up the barrels with water, after standing three or four days it will be fit for use and become quite sour, then commence using out of one of the barrels, feeding away just enough to fully satisfy their appetites night and morning; after using one barrel fill it up and commence on the other. The object is to have it as sour as possible. The result will be that the pigs will thrive finely, and in a short time be large enough to be taken from the sows and placed to themselves. The great misfortune that I have discovered, is, that those undertaking to raise hogs are too apt to endeavour to raise all the pigs that come, without calculating the number necessary alone for their use. The consequence is, that often in endeavouring to raise all, all die from the fact of being overstocked. It is very easy for us to calculate the number of pounds of meat that may be requisite for us, and raise the number of pigs only (or near it) that will produce the required quantity of pork or bacon.

The other mode is, where there is sufficient woodland, to have a number of sows running at large over the woods, and only feed them enough to make them gentle; this manner of raising hogs requires that the owner should have the common scrub hog, as they thrive and increase much faster under the above circumstances than any other kind, although they are predisposed to be more ungovernable. I have raised all the meat I have used for the last six or seven years, and have uniformly adopted the following course, viz.:—As to my young sows that I design for breeders, I invariably kill all their first pigs, and if by the time they have

another litter I do not conceive them to be of good size, I spay them and turn out others more remarkable for size, good form, &c.—by the adoption of this plan I have sows generally of fine size, and by killing off each litter of pigs afterwards to three or four, they in a general way are able to raise them before they become very poor. I always put up a goodly quantity of cotton seed early in the fall, exposed to the weather, in several parcels (to suit the different ranges of the hogs) where they become rotted and fit for use. Those seed I throw out to them as their wants may require, giving them always enough of them once a day—for those that are raised about the house I generally endeavor to have a grass lot or field, as a place for them to run in. I endeavor to raise in my corn fields pumpkins and peas sufficient to make them all, big and little, fat. While using the peas, pumpkins, &c., I have one or more troughs with salt constantly in them to prevent the peas from injuring them as they sometimes do. Thus the necessity of feeding much corn to those intended to be slaughtered is obviated. By riding pretty constantly among them in the woods and salting them, and throwing a little corn, I in the course of the year feed but little more to five or six hundred head than an hundred bushels—my hogs are not remarkable for size, their average weight being not more than 150 or 80 pounds at two years old—they however cost me but little by this mode of management, and what they lack in size can be made up by number. The great secret is not to try to raise more than a full number of pigs to answer your purpose.

It might be proper here, to make a few remarks on the management of pork after k lling it—I for several years was quite successful in saving mine and by a series of experiments have come to the conclusion that I have found out the true mode of preserving meats of all kinds in this climate. As good bacon or barrel pork can be made here as any where, in my opinion. It is a mistaken notion that a hog of almost any size cannot be saved without resorting to the mode generally adopted by our citizens of cutting out the bone, taking off the loin, &c., all of which is calculated to be of much injury to the meat, by destroying the juices and rendering it less finely flavored.

My way of saving meat is as follows:—I kill my hogs one day and salt them away the next, so that the natural heat may be entirely out. I in cutting up the pork made nine pieces of the hog, viz.: two of its head, its back-bone, and six pieces of the balance, leaving always the bone to the ham—I salt it down for that day on a platform somewhat inclined, so that the bloody water that exudes from it may run off; in the mean time I have prepared a strong pickle (by boiling it) sufficiently strong to bear up an egg or a piece of the pork; to this pickle I add a goodly quantity of saltpetre; when the pickle is *perfectly* cold, which will take at least a day and two nights, I then take up my pork, place some more

salt on it and carefully lay all the joints and bone pieces in large troughs. When the trough is even full I pack on the middlings to a considerable height as the weight is of benefit in pressing the lower meat. After packing in the above manner, I carefully pour in the pickle at one end of the trough to avoid washing off the salt placed on the meat. I fully cover all the joints with the pickle, and in that fix let it remain for five or six weeks, or until it is ascertained that it is sufficiently salted which can be tested by using it—after which I take it out, hang it up and keep a regular smoke under it until it is thoroughly dried—if I wish to canvass any of the hams I envelope them in some inferior cloth (cotton) and dip them in a solution of lime made to the consistency of paste, and hang them up to dry—the balance of the bacon I place away in the troughs in which it was salted, either in slacked ashes or fine salt, each trough having a close lid to it to keep out the skipper fly, so destructive to all meats in this climate. H.

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## TO GUARD SHEEP FROM BEING KILLED BY DOGS.

Perhaps one of the greatest obstacles to the keeping of sheep has been the savage destruction made among them by worthless curs kept throughout our country, for no other reason, that we could ever imagine, than to gratify the fancy of their owners. If these animals were kept constantly chained up where they could do no harm, no fault would be found; but when suffered to run at large and become public destroyers, it is quite another affair, and we hold every one justifiable, nay, a positive duty on their parts, to shoot all dog prowlers, without any more hesitation than they would a mad wolf.

The importation of the large Spanish shepherd dog has been recommended, as he will invariably attack and kill any dog that approaches his flock, but this would be so expensive and troublesome a measure, and it would take a long while to breed a sufficient number of them here, before they could become generally effectual. During our recent visit to Kentucky, we learned a very simple, and at the same time profitable way of guarding sheep, which is this:

Put a few active cows, with their suckling calves, in the same pasture with the flock—five would probably be enough for several hundred sheep, to which add five active three year old steers, and as many more two year olds. Take a gentle dog into the field, with a long light cord about his neck, the end held in the person's hand, accompanying, to keep him in check, and then set him on the sheep. The cows, thinking of their offspring, will immediately advance to head the dog and guard the calves, the steers will follow their example, and the sheep retreat behind them. This continues a few times, till the steers are well broken in, when the cows can be taken away and they will inevitably gore any dog to death that dare persist in attacking the flock. However brave

a dog may be in other matters, the moment he attacks the sheep, he seems to be conscious of the ignominy of it, and as if conscience stricken, becomes a coward, and will run at the slightest approach from other animals.

When the steers arrive at the age of four years, it is generally requisite to remove them to better pasture than is required for sheep, for the purpose of fattening, or they are wanted for the yoke. But just before this is done, add as many two year olds as you wish to remove of the older ones, and the three year olds left will soon break in the young ones, and so the system can be annually kept up as long as requisite.

For these guards, we would recommend a small active race of animals, with sharp horns, as they would more effectually gore and toss a dog, and it will require a small active animal to support itself on feed, that is generally as short as sheep pastures usually are. The hardy red cattle of New England would be admirable for this purpose, or indeed any active native animals, those chosen from the hill or mountainous districts would be best, as more fleet and pugnacious when required. We are told by hunters, that it is thus the wild buffalo protects himself, on the vast plains of the west, from the attacks of savage bands of wolves, and they not unfrequently afford protection to whole herds of deer. Mr. Hart, of Kentucky, defended the deer in his park by the elk, a single pair of which, would be sufficient to guard hundreds of them, as they would run down the fiercest dog in a few minutes, and cut him in two by perhaps a single stroke of the sharp hoofs of their fore feet. [*Amer. Farmer.*

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## SALTPETRE FOR MANURE.

Mr. O. M. Whipple, of Lowell, in a communication to Mr Colman upon the use of saltpetre as a manure, says:—

"Having an island in Boston harbor, called Spectacle island, and its distance from land rendering it very expensive to furnish manure for it, in the spring of 1838 I concluded to try the experiment of using saltpetre as a substitute, and in order to test its ability with some exactness, out of two which had been cultivated the year before, half an acre was set apart for the purpose of receiving 150 lbs. saltpetre, which were sowed on the surface and the whole two acres were then ploughed and planted with potatoes. At harvesting, I found that there was an increased crop upon the ground where the saltpetre had been applied. I directed the man in charge to dry 5 hills upon the ground where the saltpetre had been applied, and also 5 hills where there had been no saltpetre, and weigh each parcel. The potatoes on the ground were the saltpetre was applied, weighed 9 lbs.; the other

4 lbs.: this, it will be perceived, was the result of one year's application only. I am inclined to think that its influence will be felt more or less the second, or even third and fourth years.

A field containing two acres from which grass had been taken for eight years, I had ploughed in the spring of 1838, once only; it was ploughed deep, and 90 rods were appropriated to ruta baga. The seed was sown upon the tops of the furrows, without any manure in the drill, and the result was that I obtained 500 bushels: the remainder of the field was sown to oats, but the crop was mostly destroyed by the unexampeled growth of hog-weed. This field has been wholly sustained by the application of saltpetre upon its surface, previously to its being ploughed, excepting at the time of ploughing, when there was turned a small coat of manure."—*Colman's Fourth Report.*

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## SOWING PEAS WITH OATS.

Dr. Philips, whom we take pleasure in welcoming to the corps editorial, in the *Western Farmer and Gardener*, of which publication he is now one of the conductors, recommends sowing Peas with oats, to be turned under for manure in the fall. The quantity he recommends is one bushel to three acres. After the oats are cut off, the Peas, he says, will entirely cover the ground and furnish considerable feed, besides plenty of green manure for ploughing under. Where the Peas have not been sown with the oats he recommends that as soon as the oats are cut, the stubble should be covered in and Peas drilled over it, two feet apart in the row and about one half bushel to the acre. The Peas can then get one or two workings. When about a third of the Peas appear ripe hogs should be turned in, and by the time they have eat them out the corn-fields will be open for them. The Pea-vines should then be ploughed in to enrich the ground.

We are much pleased with this plan, and hope our farmers will now follow that part which the season yet admits of. We have no doubt but that the Pea-vine, as the Doctor says, will be found a better green manure than the much boasted red clover of the North.

[*South-Western Farmer.*

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## HANDLING COTTON.

As you say, the subject of Cotton but too readily suggests itself to the mind of every southerner—and while we may flatter ourselves at having arrived to some degree of perfection in the cultivation of the growing plant, there is one point we must all acknowledge has been too much neglected by our planters. I allude to the *handling* of Cotton after it is made or gathered from

the fields. The article advises the system of *throwing Cotton into large piles into our gins* so soon as picked, in order to undergo the process of *heating*. It contends that it diffuses the oil of the seed into the lint, thereby producing a rich color and more substantial fibre. This is an important point in the *handling* of Cotton, and the views of the writer are so different from my own, that I cannot refrain from offering you some objections to it. I regard this system as, unfortunately for our own interests, but too much in practice at present. The low condition of our Cotton market, at the present time particularly, calls for a reformation among our planters, and urges upon them the necessity of sending our crops for sale in a better condition. Much can be said upon this subject—too much is required, for me to attempt it at present, and I shall content myself merely by stating my views in relation to the system above alluded to.

I do not think, then, that the color of Cotton is improved by *heating*, but it is a serious injury in many respects. It is true some becomes more yellow—whilst some assumes a bluish cast, consequently not uniform—and even that which does become more yellow, does not present the bright lively color so much desired. We all know that there is more or less dirt or dust in Cotton when brought from the fields—by heating, this dirt stains the Cotton, or rather causes it to assume a dingy, dull appearance, in contrast with the natural, lively, bright, cream color, which it exhibits when dried upon the scaffolds. The fibre, too, is injured—loses its elasticity and strength—becomes dead and heavy in appearance. I admit that it gins more easily, but is that not an evidence of lost strength? I contend, too, that the sun, when it is exposed upon the scaffolds, will draw the oil from the seed, dissipate the water and diffuse the oil into the fibre, much better than can be accomplished by heat from moisture---the dust will be shaken out, or if not, will become so dry as not to injure the cotton before it reaches the gin stand, where it will be, or *should be*, intirely separated. Cotton which has been heated in piles will gin easier and faster, but not so well ---will be torn off from the seed in large flakes which cannot be separated by the brush, each fibre to itself, which causes it to present that carded appearance which attracts the fancy of the buyer. These are my simple reasons for believing that a thorough course of drying upon scaffolds in the sun is the better plan of producing a perfect article for market. By the one process we obtain an irregular yellow color, dull, lifeless, dingy cotton---by the other, a rich, lively, bright cream-color, with more elasticity, as is plainly discovered at the press, by those who have tried it. The writer above alluded to, is also deceived in another fact. He assigns, as a reason that the sun destroys the color of cotton, the fact, that cotton picked immediately after opening has the richest color. This is true---and it loses its color by exposure to the *dews*, and not to the sun. So,

also, cotton picked early in the season has a richer colour than that picked late, and that is owing to the sun having more power---dissipating the moisture before it has time to bleach the cotton.

These reflections I have hastily thrown together---and they are now at your disposal---should you deem worthy of insertion in the *Southern Planter*, I may from time to time give you my views in relation to other points in the *system of handling Cotton*.

Very respectfully, yours, &c. HALLER NUTT.

*Laurell Hill, Jefferson County, April 22, 1842.*

[*Southern (Miss.) Planter.*

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For the Southern Agriculturist.

## AGRICULTURAL SURVEY OF SOUTH-CAROLINA.

*Mr. Editor*,—It was with great satisfaction, I remarked, in your last number, the effort made by the South-Carolina Agricultural Society, to call the attention of agriculturalists to the propriety of an Agricultural Survey of our State. Its necessity and utility are so obvious, that a Survey should no longer be delayed; but six of our sister States have neglected this essential duty, and I regret that South-Carolina lags in the march of improvement. I hope the presidents of our Agricultural Societies will submit to the bodies over which they preside, the invitation of the South-Carolina Agricultural Society; and that they will unite in simultaneous petitions to the Legislature, to effect an object from which such great and desirable results must proceed. The reports of the Massachusetts Survey, by H. T. Colman, and those of the States of New-Hampshire and Rhode Island, by Charles J. Jackson, will give favourable specimens of the plans pursued, and their results. Every State must have a system of culture and manures adapted to its own peculiar soil and climate, and whatever has been written on the science of Agriculture can only prove in a collateral manner advantageous to local success. We must, therefore, examine our own resources, and will meet an adequate reward.

A PLANTER.

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For the Southern Agriculturist.

## UTILITY OF MACHINERY.

*Mr. Editor*,—The aid of Machinery in Agricultural pursuits, is a subject of high importance, and should meet more attention from Southern planters than it at present commands. In estimating the cost at which labour is accomplished, that of the black operative is too often slightly regarded, while the price of a Machine, or expense of working it, enters largely into a computation of the propriety of its adoption. Labour and time, properly bestowed, are true sources of wealth, and if, by aid of mechanic skill, these agents can be economised, it follows, that so much more may be applied to extended cultivation and general improvement.

Our Northern brethren, fully aware of this fact, have bestowed much attention on Machinery, and exhibited more ingenuity and success in their inventions, than any people on earth. With the Southern Agriculturalist, operatives are inherited or purchased, and the interest of capital is often lost sight of, being unfelt, as is hire which is daily to be defrayed; the first is an insensible expense—the last, a positive care. The slave-holder, however, has frequently his whole capital absorbed in lands and negroes, and commanding little cash, endeavours to avoid expenditure by executing his plans by dint of numbers and manual fore: while, on the contrary, the free labourer calls in the aid of mechanical skill to accomplish with expedition and economy similar results. As to the advantage of Machinery over manual skill, I will mention, that the Spinning Machines in Great Britain execute by the aid of 150,000 operatives, more than 40,000,000 Hindoos with their rude foot-wheel. When the Power-loom was introduced into England, which has so far extended the prosperity of that country, the spinners thought they must starve, and mobs and riots ensued, but the cheapness given to products and consequent increase of consumption by facility of manufacturing, called for more hands, and quickly dispelled that fallacy. The principle in question is the same in every clime and pursuit, and equally applicable to slave as to free population.

Let us, in confirmation, glance at the improvements, and consequent amelioration of labour which Machinery has accomplished in the lower portions of Carolina compared with what existed a few years ago. In the memory of individuals now living, the preparation of rice for market, was attended with incessant toil and loss of life. First, there was the old wooden mill, the hand-mortar and sieve. Before day the labourer was roused to pursue the process of pounding, that by sun-rise he might commence his task of threshing; this violent and protracted exertion produced exhaustion, and, in a changeable climate, liability to checked perspiration, and the attendant diseases of pleurisy, fevers, consumption, &c.

The Pecker-mill next followed, that vexer of the spirit—that destroyer of cattle, and most tedious agent, but still an improvement, as it transferred to brutes the toil which had afflicted men. The water-mill was the next great advance, superceding these rude and primitive efforts, and promoting increased production. Finally, steam, that power which is revolutionizing the world, has been applied, and will carry the process of the preparation of this grain to the highest state of perfection of which it is susceptible.

With the negro agency, engaged in the cultivation of rice, it would be impossible, under the old mode, to prepare for market anything like the number of barrels now produced. But, by the application of steam, and improvement of Machinery, the Rice-mill has been introduced into Europe, paddy exported there in the rough, and offered freshly prepared to consumers, thereby enhancing its value and increasing its consumption.

In the preparation of long staple cotton, an attempt at improvement was made, but has failed; the old, lumbering, cantering Foot-gin, has not yet been superceded by the Barrel-gin, driven either by horses or steam. Whitney's Saw-gin for short staple cotton, is completely successful, and renders the preparation of that staple for market a matter of comparatively slight importance.

But these advances in Mechanic aids have been too slow for the intelligence of the age: 140 years have elapsed since the introduction of the culture of rice, and 50 years since that of cotton, and much remains still to accomplish. Within the last five years only, has any thing like an efficient Machine been introduced for alleviating the laborious process of threshing, and its success has not yet eradicated the old process of the flail; indeed, I heard an old planter but recently declare, he thought the best threshing Machine was the arm of a stout negro of a cold, frosty morning. Such prejudices are the result of habit, and can only be removed by complete success in a Machine. This, I do not think, has been entirely accomplished, but is in a fair way of speedy attainment. Already a few planters in Georgia, and our own State, by the agency of steam, propelling three or four Machines at once, thresh their rice as it is brought in from the field, thereby saving the labour of ricking, and consequent waste of frequent handling, together with loss from theft, vermin and exposure to weather, besides the advantages of availing themselves of early or favourable markets. The Machinery necessary to accomplish this rapid operation is attended with much expense, and, therefore, without the limits of small planters, whose means require Machinery which is lighter and cheaper, and can be propelled by a smaller amount of animal power. Threshers of this cheap construction are being introduced into Georgia, where it is contemplated, by the aid of one or two horses, to thresh out from 250 to 300 bushels of rice per day. A description of these experiments communicated to this journal will confer extensive benefit. The Threshers now used in South-Carolina,

when worked by steam, usually get out 500 bushels each per day, and I have heard recently of three constructed by Mr. J. M. Phillips of Charleston, getting out each 900 bushels this fall; those propelled by animal power thresh on an average 500 bushels per day; they have all double rakes and fans attached, and those driven by animals require at least six mules or horses to propel them; the requisite motion of the beater to be kept up is 800 revolutions per minute. It might be of utility to give the size of track and dimensions of wheels in a Thresher at present propelled by animal power in which this rapidity of motion is maintained. The mode of calculation is also subjoined. The number of cogs in the drivers are divided by those of the leaders or pinions, and the result of each, multiplied together by the number of revolutions of the animals, per minute, gives the velocity of the beater, thus:

Track, 40 feet diameter, average revolutions two per minute.

King-wheel or Main-driver 180 cogs—12 feet diameter.

| | | | |
|---|---|---|---|
| Pinion, | 23 " | 20 inches | " |
| Driver, | 126 " | 6 feet | " |
| Pinion, | 18 " | | |
| Band-wheel, | 6 feet. | | |
| Sheave to the Beater, | 9 inches. | | |

Pinion 23) 180 (cogs of main driver $7\frac{3}{4}$
161 ( $7\frac{3}{4}$

19
4
76
69

Pinion 18) 126 (cogs of second drawn
126 ( 7

000

6 feet band-wheel.
12 inches.

$7\frac{3}{4}$
7
49
$3\frac{1}{2}$
$1\frac{3}{4}$
$54\frac{1}{4}$
8
432
2
434
2 revolutions of animals.
868 do. of Beater per min.

Beater Sheave 9in.) 72 (8
72 (

The weight of Machinery is yet too great, and the number of animals requisite for power too expensive. Much improvement may, therefore, be introduced, and mechanics would find it profitable to turn their ingenuity to this subject. Machines that would get out 250 bushels per day would be equal, for the time expended in threshing, to an accession of twenty-five hands per day, besides saving the labour of such weaker hands as usually are employed in the

winnowing-house, the rice from the thresher being delivered completely winnowed and ready for the pestle. If this aid from Machinery were universally adopted, how much alleviation of severe labour, and positive disease, would be saved to the negro; and in proportion to this labour saved by the threshing machine, estimating each machine as equivalent to so many hands, how much more land might be brought into cultivation.

There are many other Machines for economy of labour and preparation of products for market, which are of great utility, as tending to complete the success of a system which ought to command the attention of the agriculturalist. I will invite public attention to one for pressing fodder, called Van Hosen's Press for Hay, invented in Green County in the State of New-York; a description and cut of the press may be seen below from the April No. of the *Cultivator*.

The aid of so cheap and simple a machine as this, might induce many a planter to reap the fine crab and crow-foot grasses, which annually perishes on his river-banks and upland fields, and press them either for his own use or for market. The vast quantity of hay brought to our market, and the high price it is frequently sold at, would amply reward the labour of preparation, and evince the intimate relationship that exists between Agriculture and Machinery. In our ploughs, carts, gates, and every auxiliary to labour, the principle may be carried out, and demonstrate that Heaven gives us ingenuity to adapt the principles of reason to alleviate the toils of man, and multiply his various blessings. R. W. R.

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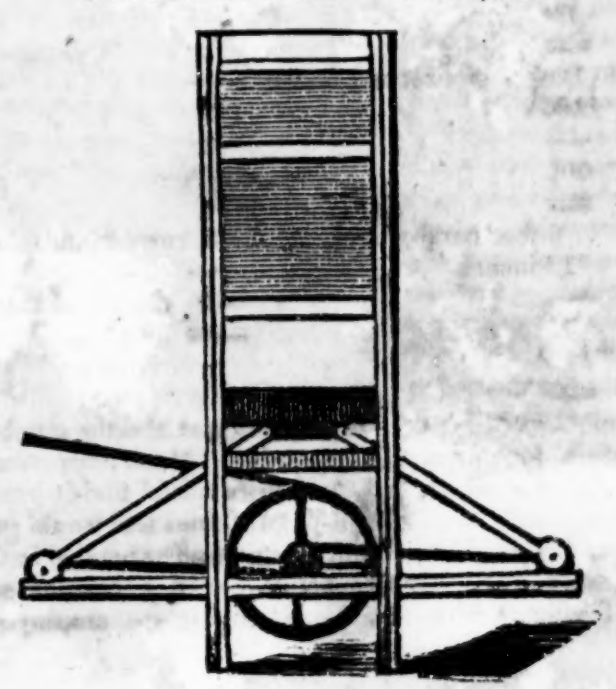
VAN HOSEN'S PRESS FOR HAY, &c.



*Messrs. Editors,*—The above cut is an illustration of the patent lever railway press, lately invented by Wm. C. Van Hosen, of Catskill, Greene County, State of New-York. The frame and box of this press are like those now in use. It will be seen by the cut, that the lower pannel is left out to show the follower or moveable bottom of the box with the end of the lever attached thereto. At the lower ends of the levers will be seen friction rollers, with a flange on each side to keep it on the track of the rail-way. Attached to the lower end of the levers are ropes or chains which are drawn in by the roller or shaft of the armed wheel. Upon the rim of this wheel is placed a rope, to which a horse may be attached, or carried to a capstan which is preferable; it will be seen by drawing in the lower ends of the levers, the follower is elevated, carrying up with it the article to be pressed; and when the greatest power is required, it is given without any additional draft of the horse. The portion of this press giving the power being made of wood is not so likely to break or get out of order as those made of cast iron. The travel for a horse in running up a bale, if attached to the rope on the arm wheel of 5 feet diameter, is 100 feet. If attached to a capstan, it is increased according to size of capstan and length of lever. While in a screw press, the travel is one mile and a half in running the screw up and down.

This press excels all others now in use for pressing hay, cotton, wool, rags, &c., &c., and will be warranted to perform well and do double the work that a screw press can with the same number of hands, with less than half the draft. A small boy can attend the horse, and the running back of the follower with perfect ease. The time required in running up the follower is about one minute. Six bales have been pressed to the hour with ease. Bales weighing over 300 pounds have been pressed by one man.

The construction of this power is such that it does not require a building expressly for it, as it may be placed in any barn or shed, and the horse may move in any direction or at any distance from it; and when the bale is ready for delivery, it is discharged instantly, and the follower gradually recedes as the hay is placed in the box.

The construction of this power is so simple that any man can make one or keep it in order. For a small expense it can be applied where the screw is now in use, and save much barn room and horse flesh.

There are several of this new style of press now in use in Greene County, and others building in different parts of the Counties of Greene and Columbia. One may be examined at the residence of the inventor, Leeds, Greene County, and one at the farm of Judge Cooke, Catskill. The latter is sunken through the threshing floor, and the horse travels outside of the barn. W. S. JACKS.

*Catskill, March 5*, 1842. [*Albany Cultivator.*

[NOTE.—There are many other implements which might be introduced, with decided advantage, into our Southern husbandry.

We will at present, however, only mention one—the substitution of the Cradle and Scythe for the sickle. Not being a rice planter, and consequently not conversant with all the details, we had supposed that some insurmountable obstacle existed, which forbid its introduction. On conversing with rice planters, however, we have not been able to discover that such is the case, and we now have the pleasure of stating that the Cradle and Scythe has been successfully employed in harvesting rice. The advantage in its use is decided and great—so great that we refrain from stating it, until further trials shall have fully tested its merits.—Ed. So. Agr.]

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## BREEDING STOCK.

Our farmers are every day getting more and more in the spirit of breeding their own Stock of every description; and we wish we had it in our power to lay all the information on the subject before them, which in older countries has been obtained by long experience and scientific research; as yet we can do no more than offer a few hints recollected from our reading.

One important principle in breeding is, that as a general rule *the male gives the prominent points of external form and color, and the female the internal structure, and constitutional propensity.* Thus we see the mule take his form from his sire, and his vigor and thrift from his dam. He inherits the mare's large chest and barrel, with the small compact muscular fibre and frame of the Jack. The Hinney, (the produce between the horse and the jenny) takes more of the form of the horse—has his small head and ears—but takes the slight and delicate constitution of his dam. The Hinney has therefore been found too weak and delicate and is scarcely ever bred.

In accordance with this rule we should breed a large barreled hardy ewe to a fine, wooled merino ram to get the body and constitution of the ewe with the fine wool of the ram. We should also breed from a sow of good constitution, with a large chest and body—a good feeder and nurse, and look to the boar for the form and size of the limbs. In cattle also we should select the dam for hardihood, thrift, size of body and milking qualities—for such are the points she will best transmit—and the sire for propertion and beauty of form.

It may not perhaps be generally known, that by attendance to the above rule, oxen in England are bred with spots to suit the taste, and the length of the horn, proportion of the bone, muscle, barrel. &c. foretold to a fraction—that spaniels are raised wooly or

smooth—game cocks raised red or black or white to suit the fancy—and the colors of pigeons, raised for cages, given at pleasure—besides the fact that horses are given by the skilful breeders—beauty—strength—speed or bottom—to suit the purpose for which the animal is wanted. [*So. Western Farmer.*

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For the Southern Agriculturist.

## QUERIES TO PLANTERS.

*To the Readers of the Southern Agriculturist:*

I am desirous of obtaining from you, through the *Agriculturist*, (with the permission of the Editor of course,) statements of your several modes of management, for the improvement of myself and others, and I flatter myself, that as many of you as may find it convenient, will give us the benefit of your experience. Will you, at your leisure, be so good as to communicate to the Editor of this paper, a plain, full, and minute account, of your planting operations, with such remarks and suggestions as you may think important. I wish you to give us such statements as will enable us to plant and tend our crops next year, precisely as you did your's this year; or, suppose you were going to leave home in January, to be absent all the year, and wished your overseer to plant and cultivate your crop next year exactly as you did yourself this year, you would give him directions in writing: a copy of such directions is what you are desired to give us. Let me beg you, not to fear that your statements can be too minute or particular.

It is not intended to interfere with the Editor's right to publish or withhold any matter according to his judgment.

Though deeply interested in planting, I have not hitherto given any attention personally to the business, but find I must do so or abandon that interest. I am not, therefore, prepared now to give others what I ask of them, but as soon as I am qualified, I pledge myself to contribute my mite to the general good.

MIDDLE COUNTY.

[*Note by the Editor.*—We insert the above request with pleasure, and sincerely hope, that several of our subscribers will reply to it: not one, but many. Let us have the different modes pursued by our planters in different sections of our country; and this will be serviceable not only to "Middle County," but to many others, who like him, are seeking information.—ED. SO. AGR.]

# HORTICULTURE.

## THE KITCHEN GARDEN.

[As mentioned in our first note, we re-publish this small work entire, and without alterations of any kind, but it will be born in mind by our readers, that these directions are intended for the climate of England, which is cooler and moister than ours in summer and colder in winter, which necessarily occasions a change in the times of sowing and cultivating certain vegetables, such as turnips, cabbages, &c. The season for performing these operations also vary; and we refer our readers to the calendar published in the last volume of the Agriculturist for particular directions as to time, and we will only observe, that as a general rule, the spring operations should be performed in a month earlier, and the fall, a month later, than indicated in this work, that being about the difference in our climate.—Ed. So. Ag.]

## THE KITCHEN GARDEN.

A hand book for Cultivators, containing full directions for the profitable culture of all kinds of culinary Vegetables. By James Main, A. L. S., author of "Flowers," and "Fruit Trees."

(Continued from page 428.)

### CULINARY FRUITS.

These are nasturtion-pods, love apple, cucumbers, vegetable marrow, unripe gooseberries, currents, apples, &c.

The Nasturtion, *(Tropæolum majus)*—Is cultivated for its green fruit used as capers or in salads, or as a pickle. The plants grow strongly and have a climbing tendency, on which account they are sown against walls, pales, &c.; or if sown in the open quarters in drills four feet apart, they should be sticked. They are a very ornamental as well as a useful plant.

Love Apple, *(Solanum lycopersicum)*—Is a tender annual, raised and nursed in pots on hot-beds in spring, and turned out against a south wall or pailing about the middle of May. The plants are of large rambling growth, and require fastening to the wall in order that the fruit may be thoroughly ripened. A favourite sauce is made of the fruit for eating with other food, and is now much more in demand than formely when French cookery was less fashionable.

The Cucumber, *(Cucumis sativa)*.—The green fruit of this tropical annual is in great estimation in this country, not only as an ingredient in salads, but also for stewing and pickling. The cultivation of early cucumbers was once one of the principal exploits of a gardener's duty and practice. No plant occasioned more expense to the master, nor more unremitting labor and attention from the servant. A cucumber fit to go to table on

Christmas day was a highly prized but very dear morsel. Notwithstanding the cost and trouble, however, producing a brace of handsome cucumbers at any time during winter or early in spring, was always accounted a clever feat, and the fruit itself a high treat.

These is now-a-days, by the extended means of gardening, less necessity for hot-bed cucumbers in winter than when their were neither forcing pits nor houses in every garden. The facilities afforded by hot water forcing, has given the gardener new powers to produce cucumbers, as well as many other dainties in the cold season, without having recourse to dung hot-beds, which are always attended with much care, labour, and attention.

But where there is no forcing house or pit, early cucumbers are cultivated in hot-beds in the following manner:—In the first place, there must be a full command of stable dung. A necessary quantity of this undergoes a preparation by being thrown together in a heap, well shaken up, by mixing the dry with the moistest parts, and if any be too dry, a sprinkling of water is given, so that the whole mass may be of a uniform dampness without being drenched. The heap must be turned over every three or four days, until it is all of equal temperament and quality, and upon the whole rather dry than otherwise; because if too moist, the bed, when made, heats too violently at first, and as quickly declines; whereas if put together rather dry, the first heat is moderate and much more lasting. A great deal depends on this preparation of the dung.

Where three or six lights for cucumbers are intended to be raised, it is usual to raise the plants three weeks or a month previous, in a one-light seed bed. This bed is made of prepared dung, the frame and light put on, and covered four or five inches thick with dry light soil. On this, seed-pans or pots of loose rich compost are placed, and when these are warmed by a fine sweet heat, the seeds are thinly pressed into the surface by the finger and covered. It is a good plan to put a nodule of rotten dung close under each seed; the first roots from which will cling round the nodule and facilitate their removal when potted off. The cucumber seedling is extremely delicate, and easily destroyed by rank steam or dry heat: and therefore much care is required to forward the plants in a kindly growing heat of about 70 or 75 degrees of Fahrenheit's scale, giving a little fresh air daily by raising the light behind.

When the seedlings have fully expanded, the seed-leaves and the first rough or perfect leaf begins to appear, they must be potted off, three together, in forty-eight size pots half-filled with rich dry compost. Round the rim of these, the plants, carefully raised from the seed-pan are laid, and their roots covered with a little more of compost, and watered a little at the roots. This done, the pots are half or wholly plunged in the soil on the bed, taking care there is not too much bottom heat. Here the plants are kept in similar temperature as above mentioned; and in the event of it sinking

too low, the frame must be surrounded with dry litter to keep in the heat, and have additional covering of hay or mats on nights.

In the meantime the fruiting beds are built at least four feet high; well compacted by the dung-forks but not trodden. The frames for early forcing are usually narrower than the melon frames; and the lights are glazed in lead, instead of overlapping.

When the bed is settled, the surface again levelled, and the frame and lights put on, and the heat has fully risen and is found mild, and sweet, and genial, conical heaps of compost are laid in the middle of each light almost as high as the glass. When these heaps are warmed, and the air within the frame appears sweet and temperate; pots of the forwardest plants are brought from the seed-bed, and being turned out of the pots, are planted on the top of each heap there to grow for good. The advantages derived from placing the plants on insulated heaps of compost are several: the plants are raised near to the glass, which prevents them being drawn—if the bed was earthed all over at once, it would bring up and arrest the heat beneath it, so that the lower part would be burned; and it would prevent the escape of that fine wholsome gas which is ever rising from fermenting well prepared dung; and which is thought so nutritious, that it is a point of good management to fork up frequently the surface of the naked dung among the hills of plants to encourage the growth. When the roots show themselves through the side of the hills an addition of fresh compost is laid all round to receive them; and this is repeated at intervals, till the whole bed is earthed over ten inches thick.

Cucumber compost is formed of fresh maiden loam one-third, leaf or fine vegetable mould another third, and another third of the richest rotten dung reduced to as fine a state as possible, but not sifted. This being a porous compost readily receives the fertilizing effluvia from the bed; not liable to bake or burn; and while it permits the free extension of the fibrous roots, readily absorbs the water necessary for it.

Pruning or stopping the plants is an important part of their culture. By nature the plant is a *climber;* but in our treatment of them we compel them to be *creepers.* To maintain this state of the plant pruning is necessary; and this is begun even in the seed-bed. As soon as the first rough leaf has attained to half its natural size, a little bud will be perceived to spring from the base of the foot-stalk; this bud, which is the central and principal apex of the plant, would, if allowed, grow directly upright, and would not be fruitful until it was of considerable height; but by displacing this bud, a first set of branches are produced, and which, if fruitful, it is well, but if they show no fruit, they must be again stopped, which will cause a second set of branches to be produced which are rarely sterile.

Experience has taught us that old or artificially dried seed is sooner fruitful than that which is new and plump; and the reason

is, that the first is of moderate growth, and requires less stopping than the last. It is right, therefore, that sterile runners be all topped as soon as they show nothing but male blossoms. Forcing cucumbers during the winter and early spring months is, without the utmost attention and skill, always a precarious business. The first change to which the plants are subject is the natural decline of heat in the bed, and which then must be kept up by linings of fresh dung; first at the back and front and soon afterwards to the ends; before these decline others must be applied, lest the plants at any time should sustain a check. The plants are, moreover, liable to many casualties; a want of sunshine will debilitate; insufficient coverings will starve; and if fresh linings be not covered with dry earth, or if a rank steam arise therefrom and be intercepted by overhanging mats so as to be let or driven into the frame, the plants will assuredly suffer. And, if, in giving air in bright frosty weather, with the wind at north, the opening have not a piece of mat hung over to prevent or break the rush of cold air in upon the warmer air within the frame, a bad consequence to the delicate plants will follow. All these accidents must be guarded against; and most creditable it is to the man who can insure success by providing against them.

Some growers who are sensible that the greatest risks happen about the time the plants are ridged out by admitting too much bottom heat, make their new bed on the top of an old one, by which they escape the risk of root-burning, and afterwards obtain the requisite degree of heat entirely from linings judiciously applied.

The principal summer crop of cucumbers for general purposes are raised from seed sown about the end of March in a hot-bed. The seedlings when large enough are potted in threes as above described, and plunged in the same or another hot bed, there to get strength and be ready to be put out under hand-glasses about the 20th of May. This crop are called *ridged* cucumbers, from the mode in which they are grown. A rank of pits two-feet square and fourteen inches deep is made across the end of a quarter in the open garden. The pits have three feet spaces between, and are filled with good well-worked stable dung raised four inches above the natural level of the ground. Marking sticks are thrust into the centre of each pit, as well to regulate the thickness of compost to be laid on, as to point out the exact place for the glasses. When the compost, formed of fresh light loam and rotten dung is laid on each pit eight or nine inches thick, and all levelled to receive the glasses, they are put on by line. When the heat has risen to warm the compost, a pot of plants is turned out of the pot and planted in the centre under each glass; a little water is given; the glasses are put firmly on, and covered with a mat for shade and shelter till the plants have made fresh roots.

Here the plants continue to grow till they fill the glasses, being occasionally watered, and every day have air admitted by raising

the south side of the glass with a prop, and shut down on nights. When there is no longer room for the growth within the glasses, the latter are taken off, the vines are spread out regularly around and fixed to the surface by little hooked sticks; the glasses being returned to their former places supported by brickbats at the corners.

Cucumbers cultivated in this way are generally very fruitful and continue bearing as long as the weather keeps warm and dry.

Cucumbers for pickling may be sown on a warm sheltered situation and south aspect in the open air about the 1st of June; and do pretty well, unless the summer proves wet and cold. They require a rich dry soil, and if the season be uncommonly dry, frequent watering is necessary.

Where there are forcing pits or hot-houses, cucumbers may be had in winter without the trouble and expense of dung hot-beds. They may be grown in large pots or boxes placed against the back wall, and as near to the glass as possible. Plants for this purpose are raised from seed in September and October; nursed and treated like those for hot-beds, and planted into pots or boxes when fit. When their vines begin to extend they are trained first upward and then downward on the trellis under the roof; and which proves a natural position for the swelling of the fruit. If the plants are in good rich compost, have abundant water, and sufficient heat, they are very fruitful, and give but little trouble; and, moreover, occupy only that part of the bulding which is least wanted for other crops.

Vegetable Marrow, *(Cucurbita succida.)*—A plant of the gourd kind, the fruit of which, when about the size of a swan's egg, are used as a table vegetable. The plants are cultivated exactly as ridged cucumbers are, and with equal success.

The Melon, *(Cucumis melo.)*—Although the melon is not a culinary fruit, it is almost always cultivated in the kitchen garden. The manner of growing them in hot-beds is very much like that of cucumbers, only they are never forced so early; the beds for them are made more substantial; and the soil prepared for them, is a rich loam with plenty of rotten dung incorporated therewith. The young plants are topped twice or oftener if necessary, and transplanted upon hills under each light of the fruiting frames, and the bed is gradually earthed over to the depth of twelve inches at least. A higher degree of heat than that named for cucumbers is also necessary, and the heat at bottom must be maintained with much steadiness by timely application of hot linings. If melon forcing begins in January, the fruit, if all has gone on well, will be fit for table about the 1st of June.

Melons are grown on ridges like cucumbers, only instead of pits a trench for the dung is continued the whole length. Two ridges are commonly made together with a deep trench as an alley between; and which, when the heat of the first trenches declines,

is filled with hot dung to assist to swell off the fruit. Single plants, or not above two together, are put under hand-glasses; and the growth promoted by every means till a sufficient number of fruit are set, say one on each plant of the largest varieties, and two of the smaller. When these are fairly set, all the runners are topped, so that the roots then have chiefly to supply the fruit.

Melons may be also grown in pots or boxes like cucumbers; but if these receptacles for the roots be elevated for the purpose of having the plants near the glass, the fruit, when they begin to swell, must be placed in saucers slung to the roof. The small sorts may be very conveniently grown in this way.

Both cucumbers and melons may be propagated by cuttings instead of seeds. The points of the runners are cut off just below the third joint from the top; these are placed in small pots of good rich loam plunged in heat and covered with a striking glass. When well rooted they are planted out for good in the same way as seedlings are, and generally prove very fruitful. When the first crop of melons are used, if the runners be cut back, and some compost added, and the bed receive a good soaking of water, and have fresh linings applied to throw in a lively heat into the bed, the plants will start again, with renewed vigour, and be again fruitful.

Setting the earliest flowers of both cucumbers and melons—that is, placing the male and female flowers in close contact, is always considered necessary especially when the season or glass covering prevent the visits of insects which usually perform this necessary service. The male flower is stripped of its corolla, and the stamen attached to the penduncle or stalk is then inserted into the centre of the female flower to cause impregnation.*

THE GOOSEBERRY, *(Ribis grossularia).*—This is so common a kitchen garden plant, and so much a culinary fruit, that it cannot be properly omitted in a hand-book like this.

The gooseberry is a native of Britain, and has been wonderfully improved by cultivation. The varieties are out of number great; and the sorts for the dessert are brought to a very large size and perfection. New sorts are obtained from seed; and the old sorts are propagated by cuttings. The shoots best suited for this purpose, are the stout healthy shoots taken from the branches of the tree, the stronger they are they better, so as they are not those luxuriant sucker-like shoots which rise from the roots or stem. The knobbed bottom and slender point of each cutting are cut off, leaving the intermediate part fourteen to eighteen inches long, if such lengths can be had. All the buds on the lower part of the cutting are cut smoothly off, leaving four or five only at the top to form the future branches. Were all the lower buds not pruned off, they would probably rise in the shape of suckers and be a constant plague to the pruner ever afterwards.

* This, however, is not absolutely necessary, except when good seed is required.

The cuttings thus prepared are dibbed firmly into the ground, either where they are intended to remain, or on a shady border or nursery-bed in rows one foot asunder. They must be let into the ground about one third of their length; another third will form a clear stem, and the remaining third, on which the buds are left, will form the head. Shoots from every bud will be produced in the spring; these should be kept free from insects during summer; and at the next winter pruning, one third of their length is cut off, regulating their number and position so that the future desired form may be obtained in the subsequent growth.

Gooseberry trees require a great deal of pruning; and there are different methods of doing this necessary work. When the fruit are wished to be very fine and large for the dessert, young trees are preferred; and those are kept very thin of the branches which are more than three years old; the largest fruit being borne by the strongest shoots of the last year, a portion of these is always reserved; and all the smaller last year's shoots produced from the branches are spurred-in, except only the leader.

But for ordinary purposes, and to have both quantity and fair quality, the trees are pruned so as to form a bush like a bowl, that is, with an open centre, the branches spreading outwards, and upwards, in all directions about one foot from each other, and rising four feet high. In this form the trees may be kept for many years; the last year's shoots being annually pruned back to form numerous spurs along the branches, and which spurs yield the crop. But as many more gooseberries are required while green than when ripe; and as the fruit are even most profitable in the green state for domestic purposes, the trees are pruned with this object in view, namely, to procure quantity rather than quality. Accordingly the trees are pruned so as to leave the head like a thick bush of numerous branches and spray, yielding great quantities of fruit, and which being all gathered green, never debilitates the trees.

Training gooseberry trees is also a common practice, they are sometimes trained in the fan manner against south walls to expedite the ripening, and on north aspects to retard their ripening and prolong their season for the table. They are also trained as espaliers; or in the simplest form of all; namely, with an upright stem tied to a stake, which has its shoots annually spurred in, whence the fruit are produced, a rank of such trained trees may stand within a foot of each other, and on a very narrow border, occupying but little space; nor are they liable to be broken by the wind. Growing *prize* gooseberries is an art of itself, and practised chiefly by manufactures, who are at great pains in raising new varieties from seed, and bringing them to perfection afterwards. The young plants are pampered by every method that can be devised to cause them to produce large fruit.

THE CURRANT, *(Ribes communis)*.—This favourite and useful fruit is allied to the gooseberry; and is propagated, pruned and

managed exactly in the same manner. Some practitioners cut off all the summer shoots, while the fruit are sweling; which no doubt increases the size and weight of the bunches; a great advantage when intended for the dessert. This however is not absolutely necessary. There are several varieties; those originally from Holland are very fine.

THE BLACK CURRANT, *(Ribes nigrum.)*—This though a less useful fruit in the kitchen than the two former, is nevertheless indispensable to the confectioner. They are propagated like the preceding; but as the fruit are only borne on the shoots produced in the former year, they are never shortened. As the oldest branches are consecutively cut out, young ones are allowed to rise from below to maintain the bulk and form of a bush about four feet high. They seem to be partial to shady places; yet there, though the fruit be larger, it is not so high flavoured. Like the others, they require a rich loamy soil.

THE RASPBERRY, *(Rubus idæus)*,—is another of our useful small fruits cultivated in the kitchen garden. No plant grows more freely though it soon gets tired of the same spot. The root is perenial, while the stems, of which a number are produced every year, are only biennial. They spring up in one year, bear fruit and die in the next. This habit of growth fixes the manner of pruning the raspberry; for as soon as the leaves are shed, the pruner has only to break or cut off close to the ground all the stems which have borne fruit, and out of the remaining young ones, select four, five, or six of the strongest to bear fruit in the next year, all other inferior stems being cut away. The preferred stems are at the same time cut down to an equal height, say to four or four and a half feet, more or less, according to the apparent strength of the canes, as they are sometimes called. There are different ways of supporting the stems in order that the wind may not blow them about; sometimes the reserved stems are only bound together at the top; or they are tied to stakes and slender rails fixed along the rows of plants. But a most convenient way of disposing the fruiting stems is when the plants stand in rows four or five feet apart, bending half the bearing wood of each plant towards each other and binding them in that position. This brings the fruitful spray close together, which facilitates gathering; and the young stems for the next year's crop rise without obstruction of the bearing wood being intermixed with them.

There is one variety called the double bearing, which yields two crops in the season. But any of the sorts may be made to fruit in autumn, by cutting away the first bearers in spring, and stopping the young shoots about midsummer; these so stopped, will throw out flowering spray, and ripen fruit before frost sets in. But as this ruins the crop of the next year, it can only be partially practised.

Raspberries are propagated by suckers pulled up from around the old stools, and planted in very open order in a free airy spot.

It is good management to establish a new plantation every third year, so that none be kept after their prime.

The Strawberry, (*Fragaria vesca*).—This is not a culinary fruit; but as it is usually seen among those that are, and, moreover, craves much attention from the kitchen-gardener, it deserves a short notice. There are many varieties of the strawberry; of which several very superior ones have been lately obtained from seed. Some of them do best when planted on a fresh sandy loam; such as the old hautbois. A majority thrive in any common kitchen-garden soil, and a few require a rich and rather clayey loam, as the old scarlet. The alpine sorts are successfully propagated by their seed; these are washed from the pulp in autumn, dried thoroughly, and kept so till March, when they may be sown. When the seedlings are large enough to handle, they are pricked into small pots, or on a shady border in beds, where, if kept duly watered throughout the summer, they will yield fruit in autumn. All the other sorts are propagated by their runners, which are produced in great abundance, and lying close to the ground soon root into it; and after which, usually in August, they may be taken up and potted three together for forcing, or planted as edgings to quarters, or in rows thirty inches apart in the open compartments of the garden. New plantations should be frequently made, as the fruit are neither so large nor plentiful after the third year. Some sorts, however, as the alpine, when planted in beds, are suffered to run together, in which state the plants renew themselves by their runners, and are consecutively fruitful, and so continue for years. Strawberry plants are not benefited by digging near the roots; if the surface among them be kept free from weeds and runners by the hoe, it is better than using the spade among them. As slugs are a great plague to the strawberry grower, they should be banished by two or three good drenchings of lime-water before the plants come in flower; and while the flowering continues, should be frequently watered to set the fruit, unless it be a showery time. Another thing is expedient, that is, to cover the ground around and under the plants with short littery straw to prevent the fruit falling, or being dashed with earth by heavy rain; this is usually done when the plants are in flower. Other schemes are employed for the same purpose, as slates, tiles, and paving bricks; and even elevated beds of brick-work are built with interstices for the plants, together with ducts for conveying water along the crown of the bed.

There are several other fruits usually called berries which are culinary, mostly natives of this or other northern countries, some of which have been partially introduced into gardens; but as many of them are found wild in unfrequented places, they are common in markets, and not worth cultivation; namely, the cranberry, snowberry, bilberry, crowberry, blackberry, clonberry, and dewberry. To these may be added, though not culinary, the barberry,

and elderberry, both of which are admitted into our shrubberries: their fruit being variously useful, as pickles, wine-making, &c.

OF MUSHROOMS, *(Agaricus campestris).*—The mushroom with two or three of its alliances, together with the truffle and morell, are the only genera of the natural order *Fungi* which are admitted into the bill of fare of the cook. The first is the only one yet cultivated, though it is said the truffle is also cultivated on the Continent.

The culture of the mushroom has been long practised, and when carefully performed, is attended with considerable success. The great art is in chosing the materials, in due quantities and qualities for the composition of the bed, and putting them together at the proper times and in a proper manner. The mushroom riots on decaying vegetable and animal matters in a certain stage of their decomposition. Fresh stable or other dung is too moist and too rank, and that which is perfectly rotten, solid and moist, is also unsuitable for encouraging the growth of the mushroom. But when the first is deserted by its ammonia, and has become nearly dry, without being entirely cold, the spawn of the fungus will appear, and the plant be perfected on such a bed, whether formed by accident or by art.

In preparing the dung, care must be taken that it is neither too moist nor too dry; too rankly fresh, nor too much decayed; but a very suitable bed may be made of new and old properly mixed together. In doing this, the object is not to have too much fresh material, lest the bed should heat too violently at first, a consequence of which would be that it would too soon become cold. But by using a proper portion of old hot bed, or other dry and half decayed dung, a moderate heat only will be generated, and which will be much more lasting.

Mushroom beds may be made in the open air, or in any shed or other roofed building. The black sheds of hot-houses are particularly suitable; for the mild warmth received through the wall against which the bed is made renders less covering necessary; though some covering is always necessary, as the plant seems to be averse to dry air, and bright light. In such situations the bed may be built either square about two or three feet high, or laid sloping against the wall. The material is beaten as firmly together as possible with the fork but not trodden; the exterior is made smooth for receiving the loam, when the bed is spawned. After the bed is made it should be covered with clean straw, and remain till it becomes fully heated, which will be in a week or ten days. A milk-warm heat should be aimed at, for the spawn cannot bear a higher degree.

The mushroom plant is subterranean; the roots and branches (if branches they be) resemble each other, the fruit only appear above the surface. The plant itself is called *spawn*, and is transferable from place to place. It can be formed, that is, generated,

by putting together the materials on which it is usually found in nature; and by the addition of these matters in the composition of a bed, mushrooms will be produced whether it be spawned or not. But it is usual to put in spawn soon as the bed is in a fit state, which is soon after the first heat begins to decline. The spawn is either purchased at a seedman's shop, or collected on the premises from the outsides of old dung-hills, cattle sheds, or from old beds when pulled to pieces. If the bed be square built, and the top level, morsels of spawn are put just within the dung, six inches apart, over the whole surface, and all beaten down smooth. If the bed be a sloping one, the spawning is begun by putting the first row six inches from the bottom from end to end; another row six inches above the first, and so on all the way to the top. It is usual, however, to leave the top unspawned till the strongest heat is disipated, when it can be done with more safety; the surface being beaten smooth with the spade. The covering of straw may then be replaced, the bed remain for a few days longer before it is earthed.

When the *watch-sticks* kept in the bed, or the thermometer (if one be used), indicate that the heat is sufficiently moderated, the bed may be earthed about two inches thick, or somewhat less, with pretty strong loamy soil, and beaten compactly with the back of a spade. A covering of straw must then be put over, in thickness according to the heat in the bed; for the heat will become greater after the bed is earthed, and if too high the spawn will suffer. Recourse must therefore be often made to the watch-sticks, to regulate the heat either by adding to or removing the covering.

Mushroom-beds, and especially those of market gardeners, are made in the open air. For these the dung is prepared, and the materials chosen are the same as for those under roofs; but the beds are differently formed; that is, they are formed like a ridge with two sloping sides and ends. The heat is regulated, and the bed is defended from frost, snow, and rain, by coverings of straw and mats. Beds exposed to all weathers require a greater share of vigilance and attention than those in houses, and the success is much more precarious.

There are many other methods practised for raising mushrooms. A composition of short stable dung, or from the circle of a horse-mill, which has not been fermented or rained upon; one-third of dry horse droppings, mixed with those of cows, sheep, or deer, will, with the two thirds dung, form such a mixture as is particularly suitable for generating or encouraging the growth of spawn. A stratum of this composition, beaten compactly into the bottom of a pit, or on the shelves only of such a building, about six or eight inches thick, will heat of itself and when planted with spawn, and soon afterwards earthed, will yield an abundant crop. Or if boxes be filled tightly with the same compost, and planted with spawn, and placed on a warm flue, or in any other warm place, mushrooms

will be produced to furnish occasional dishes for a small family; a temperature of about fifty-six degrees is the necessary degree of heat, both for setting the spawn to work,—that is, to extend itself, and to throw up the mushrooms.

It has been observed, that if the spring months be dry, and the summer wet or showery, we usually have abundance of wild mushrooms on meadow and pasture ground. For this circumstance, a rule has been laid down to keep our beds dry while the spawn is working; and in five or six weeks after the bed is made, the earth appears loose and dry, it should receive a shower of tepid water, which will probably soon after bring up the crop. This, however, depends on the state of the dung of which the bed was made. If it was damp, it may continue to exhale as much moisture through the earth as the spawn may require, and of course no watering will be necessary; but if, on the other hand, it was particularly dry, it is probable a fine shower will be beneficial.

It sometimes happens that a bed will become too cold before it yields a crop; in this case the bed should be stripped naked, and covered all over with a coat of hot fresh dung, to remain for two or three days, and then to be removed entirely, and again be covered with straw. From this, as much heat will be communicated as will renew the heat of the bed, and revive the working of the spawn, and very likely render the bed fruitful.

(To be continued.)

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## ASPARAGUS.

A few weeks since, we reported briefly the substance of a paper upon the cultivation of asparagus in the north of Spain, which was communicated to the Horticultural Society by Captain Churchill, of the Royal Marines. This gallant officer was at St. Sebastian during its occupation by General Evans; and he profited by such leisure as his military duties afforded him, to make himself acquainted with natural history and horticulture of Guipuscoa. We might content ourselves with merely referring the many inquirers who want to know how to grow asparagus well, to the report just alluded to; but in our opinion it is much too important to be passed with so little attention.

Asparagus is probably the vegetable most generally admired and most seldom well cultivated: it is only here and there that it is large, tender and delicate. In country gardens it is small, green, and strong; in the London market it is long, white, hard and tough: to the eye attractive enough, but to the taste more like bleached timber than an esculent. Indeed, we have never been able to comprehend the reason why, in this our age of improvement, some ingenious turner has not produced imitation sticks, which might be

tipped with half an inch of eatable asparagus, and thus spare the necessity of cooking four-fifths of the stuff that is brought to a London table. Covent Garden asparagus is assuredly the worst in Europe. For this reason, when really fine asparagus is met with, people think it must be some peculiar sort—obtain the roots from Vienna, Berlin, Hamburgh, Battersea, or Deptford, and then, when they find them producing heads identically with what they had before, lay the blame to the seedsman, or the soil, or the climate, or any thing rather than their own want of skill. There is but one sort of asparagus, be its name what it may; all the difference consists in its cultivation.

Captain Churchill says the Guipuscoan asparagus measures from three to six and more inches in circumference. How this is obtained, his excellent account leaves no room for doubt.

Asparagus is a plant found naturally on the beach of various parts of the coast of Europe, where it is covered by the drifting sand, and watered by salt water at high tides. Sand and salt water occasionally may, therefore, be regarded as indispensible conditions for maintaining it in health. How seldom is this thought of! It, however, explains in part the excellence of St. Sebastian asparagus.

It seems that at the mouth of the Urumea is a narrow slip of land, about three feet above high-water mark, consisting of alluvial soil and the wearing away of sandstone hills, at whose foot it is placed. This is the asparagus ground of St. Sebastian. Beds are formed five feet wide, without any previous preparation except digging and raking. In March the seed is sown in two drills, about two inches deep, and 18 inches from the alleys, thus leaving a space of two feet between the drills. The rows run invariably E. and W.—doubtless in order that the plants may shade the ground during the heats of summer. When the seedlings are about six inches high, they are thinned to something more than a foot apart. Water is conducted once a day among the alleys and over the beds, so as to give the seedling an abundant and constant supply of fluid during the season of their growth. This is the cultivation during the first year.

The second year, in the month of March, the beds are covered with three or four inches of fresh night soil from the reservoirs of the town; it remains on them during the succeeding autumn; the operation of irrigation being continued as during the first season. This excessive stimulus, and the abundant room the plants have to grow in, must necessarily make them extremely vigorous, and prepare them for the production of gigantic sprouts.

In the third spring, the asparagus is fit to cut. Doubtless all its energies are developed by the digging in of the manure in the autumn of the second year; and when it does begin to sprout, it finds its roots in contact with a soil of inexhaustible fertility. Previously, however, to the cutting, each bed is covered in the course of March very lightly with dead leaves, to the depth of about

eight inches: and the cutting does not commence till the plants peep through this covering, when it is carefully removed from the stems, in order that the finest only may be cut, which are rendered white by their leafy covering, and succulent by the excessive richness of the soil.

In the autumn of the third year, after the first cutting, the leaves are removed, and the beds again dressed with fresh night-soil as before; and these operations are repeated year after year. In addition to this, the beds are half under salt water annually at spring tides.

Let any one compare the mode of culture with ours, and there will be no room for wondering at the difference in the result. The Spaniards use a light, sandy soil; we are content with any thing short of clay. They irrigate; we trust to our rainy climate. They know the value of salt water to a sea coast plant; we take no means to imitate nature in this respect. They dress their beds with the most powerful of all manures; we are contented with the black residuum of a cucumber frame, which is comparatively a *caput mortuum*. Finally, they throw leaves lightly over their beds, by which means they expose the young sprouts to the least amount of resistance, and force them onward by the warmth collected from the sun by such beds of leaves; we, on the other hand, compel the asparagus to struggle through solid earth, capable in the smallest possible degree of absorbing warmth during the day—but, on the other hand, ready to part with its heat again at night to the greatest possible amount.

Can any one wonder, then, at the poor results obtained by our manner of cultivation?—or that some gardener should now and then astonish his neighbours by producing asparagus which we call giant, but which at St. Sebastian would be called second rate?

[*British Gardener's Chronicle.*

[Wherever objection might be entertained against the use of night soil as a manure, a substitute might be made of well rotted horse dung with which plaster had been mixed before it had undergone the process of decomposition, and the efficacy of this would be greatly enlarged by saturating the mass with liquid manure from the stable, or soapsuds from the laundry.

We think too, that it would be productive of good to dig in the leaves, instead of scraping them off, as directed; as they would doubtless tend to lighten the soil, increase its nourishment, as well as impart to it a greater capacity for the absorption and retention of moisture.

Where, from location, the flooding of salt tides cannot be availed of, the beds might find a very excellent substitute in weak solutions of salt and water, poured on twice a week during the forcing season, from a watering pot.—*Editor Am. Farmer.*]

## THE POTATO.—IMPORTANT FACTS.

A writer in the March number of the *Farmer's Cabinet*, gives the following statement as to the production of the Potato. Believing it, if true, to be of some importance to our readers, we lay it before them.

"It is perhaps not generally known, that in the Potato there are two parts, which, if separated and planted at the same time, one will produce tubers fit for the table eight or ten days earlier than the other. This fact has fallen under my own observation, and is the plan I now pursue in order to obtain an early supply for my table, fine and very mealy. The apex or small end of the potato, which is generally full of eyes, is that part that produces the earliest—the middle or body of the potato produces later, and always large ones. The butt or naval end worthless, except for feeding stock, and, if planted, produces very indifferent small ones, and often none at all, the eyes, if any, being imperfectly formed. The potato being cut two weeks before planted, and spread on a floor, that the wound may heal, separating the small end from the middle, then cutting off the naval or butt, the body or middle of the potato is then divided into two pieces lengthwise, taking care to have always the largest and finest selected, being convinced that if none but large potatoes are planted, large ones will be again produced—small things produce small things again, and therefore no small potatoes should be planted; this practice is too prevalent, and may account for the many varieties and small potatoes met with in our mrrkets. Who would not prefer a large mealy potato to a small one, that will take hours to boil soft, and then may only be fit to feed the cattle with?

"For several years past I have adopted the plan of putting potatoes into the ground late in fall, covering them with manure, sometimes with tanners' waste bark, and always have succeeded in raising a fine early crop. Last fall I had taken up some as fine and large Mercer potatoes as any one could wish; they were covered with tan six inches thick the preceding fall; many weighed sixteen ounces. No particular care or attention was bestowed upon them through the summer, the tan not permitting any weeds to trouble them, or to draw out the nourishment from the earth, they had therefore all the benefit of the soil, kept moist and clean by the tan, for tan will keep the ground moist and clean, and in an improved state in the driest season. I have found the great advantage of it to my asparagus and strawberry beds, which are annually covered with it.

"The potato I consider so valuable and indispensable a vegetable, and having never seen a suggestion in print of separating the potato and planting each by itself, that I have been induced to send you

this communication. Perhaps some of your readers will try the experiment planting separately each part of the tuber, believing that the potato may be much improved by a due regard to the above suggestions.

J. F. H.

"*Lancaster, Feb.* 25, 1842." [*American Farmer.*

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## THE ORCHARD.

### TO PROTECT FRUIT FROM LATE SPRING FROST.

*Sir*,—Many expedients have been resorted to for the protection of fruit from the blighting influence of late frosts. Throwing a sheet over the tree, hanging iron upon it, kindling a fire under it, &c. have each been found to have a beneficial influence, but none have been more efficient than the experiment which I am about to describe.

My friend, Major Ruff, who is a virtuoso, lately informed me that many years ago he saw it stated in a French paper, that by throwing a hempen rope over the top of a fruit tree, when in bloom or near the time of blooming, and by letting its lower end touch the ground, the tree would thus be protected from the influence of frost. This I thought quite rational and philosophic, I accordingly made the experiment. To prove more fully the *modus operandi* I took two dishes half filled with water, and set them a few feet distant, under the tree, on the night before an expected frost, the tree being nearly in full bloom. Throwing the rope over the top of the tree I let the other end hang in the water of one of the dishes—the event proved the correctness of the theory. There was a hard frost on the morning of the 27th inst. and the dish into which the rope was deposited, contained ice of the thickness of a dollar, while that in the other dish was scarcely of the thickness of paper.

The philosophy of the above experiment is this: the rope, which was previously wetted, was a conductor of the heat; the air, and of course the limbs of the tree, became *colder* in the night than the earth—the rope conducted the heat from the earth to the tree, thus keeping up an equilibrium and preserving the tree from frost.

As far as my observation extends, the critical time for fruit is long before it is in blossom; but it is nevertheless true, that severe and protracted cold at that time, or even later, will destroy the fruit. This was the case last year. The fruit was killed by severe frost after it had been formed.

There is not in my mind a doubt that by attaching a rope to each tree of choice fruit, and thus letting it permanently remain through the winter and spring, that the fruit would be secured from the effects of frost.

To the incredulous and the supercilious, who balance their grist all their lives with a big stone—who, sufficiently wise, despise knowledge and instruction, the above may appear unworthy their attention. Let such be informed that it is not less philosophic than lightning rods attached to buildings to protect them from the influence of electricity—Let them be informed that

"There are more things in Heaven and Earth
"Than their philosophy has ever dreamed of."

W. L. HORTON.

*Woodlawn, Hartford Co., March 29th*, 1842.

[*American Farmer.*

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## MEANS OF DESTROYING THE CURCULIO.

The following plan for destroying the Curculio, is from the pen of one of the most eminent nurserymen in our country, who is distinguished alike for his practical good sense, and scientific attainments.

The *Curculio* is one of the greatest enemies of the plum; indeed, in many sections of the country, the whole crop is frequently swept off by its attacks. When its habits are well known, however, a little care will enable us to rid our gardens of these insects, so destructive o stone fruit

The Curculio is a winged insect, which emerges from the ground about the time when the trees are in blossom, and punctures the fruit almost as soon as it is formed, depositing its eggs in the tender skin of the swollen germ. When the fruit has reached one-third of its size, if we observe it closely, we shall discover the scar of this puncture made by the insect, in the shape of a semi-circle or small crescent, about a tenth of an inch in breadth. The egg has now taken the larva form, and the latter is working its way gradually to the stone or kernel of the fruit; as soon as it reaches this point, the fruit falls from the tree, and the worm now leaves it in a few days, and finds its way into the loose soil beneath the tree. Here it remains until the ensuing season, when it emerges in a winged form, and having deposited its egg to provide for the perpetuity of its species, perishes.

As it is found that the Curculio, though a winged insect, is not a very migratory one, the means taken to destroy it in one garden are not without efficacy, though the neighboring orchards may not receive the same care. As the fruit, when it falls from the tree, contains the larva, it is evident that if we destroy it before the insect has time to find its way into the soil, we shall destroy with it the Curculio. In small gardens, it is sufficient to gather all fallen fruit

every morning, during the period of its fall from the tree, and throw it in the hog-pens, when the whole will be speedily consumed. In larger orchards, where it is practicable, the hogs may (the trees being protected,) be turned in for the short time in the season while the fruit is dropping, and they will most effectually destroy the whole race of insects of the current season. Indeed, in large plum orchards, this practice is found a very effectual remedy for the attacks of the Curculio.

In small gardens that have come under our notice, formerly much troubled with the attacks of this insect, where the practice of gathering the fruit and destroying it daily for a short period, has been pursued, the insect failed to make its appearance after a couple of years, and the trees have borne abundant crops of the fruit. In addition to this, we would recommend the application of clay about the roots of plum trees, in very light sandy soil.

It is sometimes the case that the plum will be many years in coming into bearing, where the richness of the soil induces too great a luxuriance of growth. When this is the case, the ground should be partially removed from the roots, which should be pruned or reduced in number one-fifth or one-fourth, and the soil replaced. This should be done in the autumn, and will rarely fail in bringing about a profusion of blossom buds and a good crop of fruit.

A. J. D.

*Newburgh, N. Y., Feb.*, 1842. [*American Farmer.*

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## TRANSPLANTING TREES.

Most nut-bearing trees may be as much improved by transplanting and grafting, as fruit trees are. The hickory and chesnut may thus be made to bear nuts far better flavored, and three times as large as they produce in an uncultivated state. In a good soil, they will soon come to maturity; and for shade, fuel, and timber, the chesnut, butternut and hickory, are not inferior to the unproductive horse-chesnut, bass-wood, elm and maple. Late in autumn, or in spring, is the time for transplanting;—for which, and for grafting, the same course is to be pursued as with the apple or pear tree—care being taken to place the roots about the same depth in the earth that they naturally grew.

When the buds just begin to expand, or take the leaf form, is considered the most favorable time for grafting nuts; this takes place about the last of May.—*Selected.*

## FLORICULTURE.

### REMARKS ON THE METHOD OF RAISING SEEDLING CAMELLIAS AS PRACTISED IN WASHINGTON, D. C.—BY DR. J. S. GUNNELL.

In a late number of your Magazine, you alluded to Mr. J. B. Smith's method of raising camellias by hybridization, so as to increase and improve the varieties of this superb flower. In your number for April, which now lies before me, I notice a further account of the experience of another amateur in Philadelphia.

As I have had some considerable experience in producing new seedling camellias, I will give you a brief account of my practice also, not intending to call in question the plan or system of any other cultivator. I generally take a pair of curved forceps, pliers, or tweezers, with which I can pick out all the anthers or stamens from the bottom of the flowers: I then apply the farina or pollen, selected on purpose, directly to the stigma; this I do with one, or as many varieties as I can get from flowers that are suitable to select from. I find, by using the pollen from white camellias, (although it be applied to the stigmas of red ones,) the progeny are apt to be mostly white or light colored varieties; and when the pollen from a white variety is applied to the stigma of another white flower, the young plants are almost certain to produce light flowers, or those with light grounds.

When I have a fine variety in bloom, from which it is desirable to impregnate others, and have no plants in flower to enable me to do so, I frequently select plants which show buds nearly ready to expand, and take off the petals, afterwards applying the pollen in the usual manner, not forgetting, however, to repeat it for two or three days in succession, so as to insure certainty of fecundation. By following this method, complete success has been the result, and the opportunity has not been lost, which may often happen if the cultivator is obliged to wait until a flower is expanded, of impregnating with some of the most superb sorts. I am never influenced by the time of day, or temperature of the house, in my practice, but perform the operation at all times, when convenient to do so, and I have not perceived but that the same success attended all my experiments.

About three years since, I succeeded in seeding the Camél*lia* *m*aliflòra or *Sasánqua* ròsea, but had the misfortune to lose the seed pod by having it knocked off the plant. I have again, the past winter, succeeded in impregnating the stigmas of flowers of the same species or variety, and they are now swelling, and about the size of peas.

I have occasionally seen a few anthers in the Camellias var. imbricàta, Lándreth*i*, Hume's blush, and such like extra or mag-

nificent kinds; but about four weeks ago I was not a little astonished to notice, in the collection of plants belonging to J. Douglass, Jr., of this city, two different plants of Hume's blush, with splendid large flowers on each, and upwards of thirty anthers, covered with fine prolific pollen. One of the plants was imported, and the other was a plant inarched here, but not from the imported one: each of the plants had a number of flowers expanded, some with anthers and some without. Mr. Douglass kindly gave some of the pollen to most of our amateur cultivators, who have fertilized flowers, from which we hope to produce some superb varieties in a few years.

As many of the amateurs in the District of Columbia have succeeded in raising new and fine varieties by the plan now detailed, I have deemed it advisable, especially for the assistance of others who may wish to assist in enriching our gardens with new kinds, to send you this account of our practice. J. S. GUNNELL.

*Washington, D. C., April 14th*, 1842.

[*Boston Hort. Mag.*

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## MISCELLANEOUS.

### WINTER BUTTER.

Every person at all familiar with the process of making butter, is well aware of the difficulty attending the success of making it in the winter. It is generally known, too, that butter made at this season of the year, is very white, crumbles, and is deficient both in flavor and color, and not considered fit for the table. This arises partly from the cows being kept, as they generally are at this season of the year, upon dry food, and partly from not managing the milk rightly.

In the statement of Mr. Merrifield, who took the second premium for butter at the late meeting of the Sate Agricultural Society, he says—"In winter our milk stands twelve hours, is then removed to the stove, and scalded over a slow fire to near boiling heat; the pans removed to the cellar, to cool; the cream only churned: the butter placed in the coolest part of the house, will keep good any length of time." His butter was much admired for its rich yellow color and fine flavor, but I should thing the scalding process rather tedious and troublesome.

On perusing the 7th addition of "Mowbry on Poultry," a few few days since, I found the following process, as practiced in some parts of England, which struck me very favorably, and I was determined to try some experiments. The following is the process, as detailed in the above work, which I have transcribed, as it may not be in the hands of all the readers of this journal.

"A peculiar process," says Mowbray, "of extracting cream from milk, by which a superior richness is produced in the cream,

has long been known in Devonshire; this produce of the dairies of that country being well known to every one by the name of 'clotted' or 'clouted cream.' As there is no peculiarity in the milk from which this fluid is extracted, it has been frequently a matter of surprise that the process has not been adopted in other part of the kingdom. A four-sided vessel is formed of zinc plates, 12 inches long, 8 inches wide, and 6 inches deep, with a false bottom at one half the depth. The only communication with the lower compartment is by the lip, through which it may be filled or emptied. Having first placed at the bottom of the upper compartment a plate of perforated zinc, the area of which is equal to that of the false bottom, a gallon of milk is poured (immediately when drawn from the cow) into it, and must remain there at rest for twelve hours; an equal quantity of boiling water must then be poured into the lower compartment, through the lip; it is then permitted to stand twelve hours more (that is, twenty-four hours altogether;) when the cream will be found perfect, and of such consistence that the whole may be lifted off by the finger and thumb. It is, however, more effectually removed by gently raising the perforated plate of zinc from the bottom by the ringed handles, by which means the whole of the cream is lifted off in a sheet, without remixing any part of it with the milk below. With this apparatus I have instituted a series of experiments; and as a mean of twelve successive ones, I obtained the following results:—4 gallons of milk, treated as above, produced in twenty-four hours, 4½ pints of clotted cream, which, after churning only 15 minutes, gave 40 oz. of butter;—4 gallons of milk treated in the common mode, in earthen pans, and standing 48 hours, produced 4 pints of cream, which, after churning *ninety minutes*, gave 36 oz. of butter. The increase in the quantity of cream, therefore, is 12½ per cent., and of butter 11 per cent."

From the above hints, I caused a pan to be made, three and an half inches deep, and very flaring; another made six inches high on the side and not so flaring, and just large enough to receive the other pan, and then carefully soldered together at the top. Two short tubes were soldered into the lower pan, one about one inch in diameter, for pouring in the water, the other tube very small, on the opposite side, to let the air escape when admitting the water, and also to admit the air when the water is to be turned out.

With this apparatus I commenced a series of experiments, and the following are the results:

*Experiment* 1. Strained 11 lbs. of milk fresh drawn from the cow into the pan; after letting it stand twelve hours, put four quarts of boiling water into the under pan, and secured the aperture with a cork. Thirty-six hours after, the cream was carefully taken off, being very thick and tough, and of a fine yellowish color. Twelve hours after, it was churned with a spoon, which occupied seven minutes, and produced 5 oz. of butter.

*Experiment* 2. The same quantity of milk was put into the same pan, and after standing twelve hours, four quarts of boiling water was introduced, and suffered to stand twenty four hours, when it was skimmed, and immediately churned, which took eleven minutes to convert it into butter. Produce, 6 oz.

*Experiment* 3. The same quantity of milk fresh drawn from the cow, was put into the pan—stood twelve hours, when four quarts of boiling water was introduced, as before, and after standing twelve hours longer, was carefully skimmed, and twelve hours afterwards was converted into butter in *one minute*. Produce, 7 oz.

The three parcels were put together, and after being well worked, they weighed, with a common pair of steel-yards, 1¼ lb., being a fraction less than 9½ quarts of milk to produce one pound of butter; and it is my opinion, had it all been subjected to the same process as example 3d, it would have been considerably increased in quantity. It must be observed, however, that the milk was taken from a two year old heifer, half Durham and half Ayrshire, and the difference in quantity of the butter when separate or when put together, may be accounted for by the difficulty of weighing so small a quantity with the steel-yards.

*Experiment* 4. Strained 11 lbs. of milk fresh from the cow, into a pan of the same size, and after standing thirty-six hours, it was carefully skimmed, and the same process adopted as before to convert it into butter. After diligently working at it 90 minutes, "it was no go," or in dairy language, "it would not come." We then tried to coax it, by turning in a small quantity of cool water; then tried hot water, but it was of no use. It was then set by for twelve hours, and then tried again, and after working it for half an hour, it was given up in dispair: "come it *would not*," and so we concluded to let it "go to the"—*cook*. One other experiment, on the same principle as the foregoing, was afterwards tried, and the result the same; after churning the cream sixty minutes, it was frothy, and had the appearance of whip-syllabub more than any think else that I can compare it to.

Two other experiments were tried on the "high pressure" or hot water principle, which resulted about the same as Nos. 2 and 3, except the time consumed in the churning—one being four and the other seven minutes. The difference was caused, probably, by the temperature of the weather.

Since writing the above, we have tried two more experiments, with the same quantity of milk, after standing twelve hours, and then adding the hot water; one was churned immediately, which took seven minutes—produce 8 oz. The other was churned twelve hours after skimming, and was converted into butter in ten and a half minutes—produce, 8 oz. In these two experiments, the quantity is considerably increased, being at the rate of 1 lb. to 8 qts. of milk.

From the above experiments, I am well satisfied of the great advantage arising from this process, and have no doubt but a great

saving may be made, and *good butter* produced, even in the coldest weather. And I would recommend it particularly to those who only keep one or two cows, as by this means a small family could be supplied with their butter. And I am also satisfied that it is the best plan to let it stand only twenty-four hours, and churn immediately after skimming.

I would suggest an improvement, which I intend to adopt, in the pans, which would be a saving of expense, besides some trouble in washing and drying the pans. Let the under, or water pans, be straighter on the sides, and as much smaller as to strike the upper, or milk pan, about one inch from top, and fit tight, so that the steam will not escape, having a small tube inserted in the side, for admitting the hot water, and a small hole on the other side to let off the air, as in the one before mentioned. Being separate, they can be washed and dried without difficulty.

Butter is one of the staple productions of our State, and every hint that serves to improve its quality or increase its quantity, must be useful. There are various methods of making butter, and there is certainly a vast difference in its quality. One cause of this difference may be ascribed to the herbage or food upon which the cows are fed, the breed of cows, or the season; but more generally in the management. Every one thinks his own method the best, and, *too wise to learn*, sneers at the very idea of philosophy or science having any sort of connexion with this humble branch of domestic industry. All I ask of the unbelievers in new theories is, to try the above method, and I am certain they will be convinced, and well satisfied with the results.

A writer in one of the old volumes of the New-England Farmer says, in regard to the color and flavor of butter, "to correct both these evils, take four yellow carrots, of about one and a half inches in diameter, to cream enough to make ten pounds of butter, and after washing them, grate and cover them with milk, and after they have stood ten minutes, squeeze them through a cloth into the cream, and the effect has been to make the butter come quicker, and give the color and *sweetness* [?] of May butter." Mrs. B., who sits at my elbow, suggests as an improvement on the above, to give the carrots to the *cows*, in sufficient quantities, and readily believes that, used in that form, they will impart a fine color to the butter, and even add a richer flavor—that *substance*, and not coloring matter, is required to give much flavor. C. N. Bement.

*Three Hills Farm, Albany, March*, 1842.

[*Northern Light.*

### PAN FOR MAKING GOOD BUTTER.

*Messrs. Editors,*—In the 12th No. of the *Northern Light*, published at Albany, I have communicated a series of experiments, which I instituted in regard to making *good* butter in cold weather; and as that paper may not have a very extensive circulation among the farmers of your vicinity, which is something of a dairy district, I think you would confer a favor to your subscribers by publishing a part or the whole of it.

Since those experiments were instituted, I have had some pans made as suggested, and followed the same method with entire success, and can, therefore, recommend it with great confidence to all dairy women, as being neither joke nor humbuggery.

* * * * * * *

The outside pan is made a little straighter on the sides, and one third deeper than the milk-pan, which will admit it within two inches of the bottom, resting on the edge of the under or water pan. A small tube is inserted on the side near the top to admit the hot water without disturbing the milk, which should always be avoided if possible. In summer when the weather is warm, cold water may be substituted, or if necessary, the water pans could be used for milk.

As regards the time consumed in churning, I consider of no consequence, except the labor, which to be sure, when 5 or 6 lbs. is churned at one time, is not a very easy task, as the cream is so thick and stiff that it is no easy matter to raise the dasher.

Since I made the communication to the *N. Light*, we have converted the cream into butter in 30 seconds—then it takes more time to *gather* it. In the former experiments a bowl and spoon was used; for the late churnings we have used a small stone ware churn, and from 2 to 3 minutes has been occupied in churning. Since I have commenced this article, 4½ lbs. of butter, has been churned in 3 minutes.

Should any of your subscribers try the experiment, I should be pleased to have them communicate the result in your paper.

C. N. BEMENT.

[*Boston Cultivator.*

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## GARDENER'S CALENDAR FOR SEPTEMBER.

### VEGETABLE GARDEN.

**Sow early Dutch and other varieties of turnips, ruta baga, beets, Swiss chard, mangle wurtzle, carrots, parsnips, salsafy, lettuce, spinach, cabbages, (English seed) onions, radishes, endive. Plant snap beans. Transplant ruta baga, cabbages, cauliflowers, brocoli, celery, lettuce, leeks, endive.**

*Remarks*—In this month, the principal crops of turnips, beets, carrots, parsnips, &c. should be sown, as they will acquire sufficient strength to withstand the cold weather before the winter sets in. When thining out the ruta baga, the plants should be reserved and transplanted out either into those spaces where they have failed, or into a piece prepared expressly for them. If the cabbage seeds are not English, they will run to seed in the spring without heading.

# Agricultural and Horticultural
# REPOSITORY.

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FRESH AND GENUINE

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BEANS—nineteen varieties, among which are Dutch Dwarf, Davenport, China, Royal Dwarf, Horticultural, &c. &c.

BEETS—eight varieties, consisting of Early Turnip (red and yellow,) Long Blood, Yellow Castelnanderry, Red do., Silesia or Sugar, &c. &c.

CABBAGES—twenty-nine varieties, among which are Early Paris Superfine, Nonpareil, Hope, Vanack, Early York, Ox heart (large and small,) Battersea, St. Dennis, Early Dutch, Large do., Large Pancallier Savoy of Tours, Monstrous French Savoy, &c. &c.

BROCOLI—three varieties.

CAULIFLOWERS—six varieties, viz.: Tender or Spring, Half-hard for autumn, Hardy of Paris, Dutch Hardy, Early and Late.

CARROTS—nine varieties. PARSNIPS—two varieties. CELERY—seven varieties. CRESS—three varieties. LETTUCE—nine varieties. CUCUMBER—four varieties. SQUASHES—seven varieties. MELONS. *Musk*—nineteen superior varieties *from France*, embracing the Honfleur, Canteleups, Sugar, Persian, Winter, and many others in high estimation. Also, six varieties of American. WATER-MELONS—three varieties. KOHL RABBI—four varieties.

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Printed Catalogues will be furnished gratis on application (*post paid,*) and all Orders promptly executed. SEEDS and IMPLEMENTS carefully packed and sent by Steam-boat Rail-road, to any part of this State, North-Carolina or Georgia.

*November 4th*, 1841. J. D. LEGARE.

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*Payments to So. Agriculturist.*—Apprentices Library Society, 1842; J. H. Tucker, 1842; Dr. Wm. Yates, 1842; Daniel Legare, 1841; C. W. Simmons, 1842; R. S. Miller, 1841 and 1842; Dr. Thos. Smith, Society Hill, 1842; T. R. M'Faddan, Bradleyville, 1840, '41, '42; Edward Turner, Natchez, 1842.